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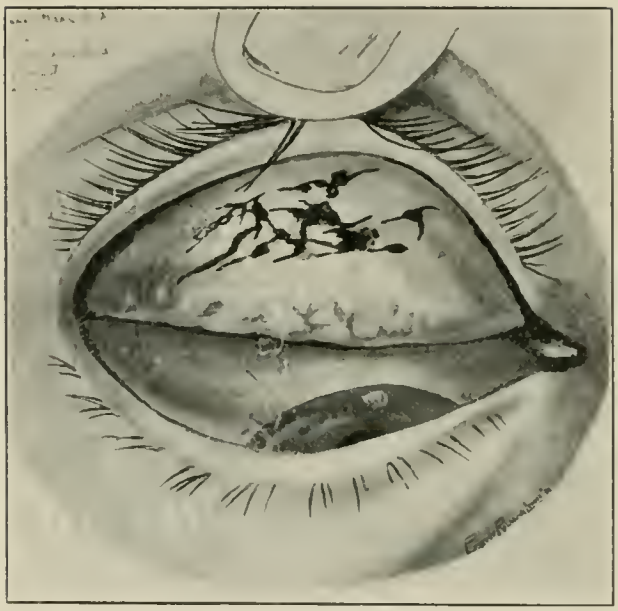
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THE ANNALS
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ON TRACHOMATOUS SPOTS IN THE MALAY.

BY DR. L. STEINER,

SOERABAYA, JAVA,

TRANSLATED BY

DR. C. ZIMMERMANN,

MILWAUKEE, WIS.

ILLUSTRATED.

In the course of trachoma, in the conjunctiva of the Malay, pecular black spots occur, which, as far as I know, although a frequent and striking phenomenon, have not yet been described. They generally form an irregular network of black dots and lines; sometimes coarse, like the drawing, sometimes very fine, especially in older cases. In others, a large, more or less regular, equally black patch, and in others transitions between these forms are found. Their seat of predilection is the conjunctiva of the upper lid, a few mm. above the border, but also other parts of the palpebral conjunctiva are invaded but never the ocular conjunctiva.

The latter, however, often shows other kinds of pigmentation:

(a) A more or less diffuse brown coloration with interspersed darker places extending from the cornea as far as

the conjunctiva is exposed. It very often accompanies incipient pterygium.

(b) Circumscribed regularly round black spots like ink, from the size of the head of a pin to that of a pea, which are analogous to the pigmented nævi with which the skin of the Malay is so frequently covered.

From a practice of many years in which I daily saw numerous cases of trachoma, I can safely assert that the two kinds of patches first mentioned, are produced by trachoma. With rare exceptions I always found, on closer examination, with these patches symptoms of former, or still present, trachoma. The peculiarity of the trachomatous conjunctiva explains the reticular form of many of these patches, the development of which I could directly observe, in the following manner. In recent inflammatory trachoma the pigment, which, as I shall show, is contained in the epithelium, may be easily wiped off with cotton, and the patch appears lighter. This occurs mostly at the projecting trachomatous granules, whereas the color remains in the better protected surrounding furrows. Thus an indistinct and irregular network is formed. The same happens daily to the trachomatous patient. The apices of the follicles rub off their black color on the rough and ulcerated cornea. After the subsidence of the disease and the follicles, the dark net-meshes remain, which correspond to the former furrows, and the lighter islets between are the remnants of the former follicles.

The microscopic examination of pieces of the conjunctiva revealed the pigment in the lowest stratum of the epithelium, mostly in the epithelial cells. In recent inflammations these are clumsy, roundish and often very large, in older cases with cicatrization, much finer, star-shaped with many ramifications. But there also will be found thin pigmented lines between the epithelia, and frequently minute roundish black granules and pigmented round cells immediately under the epithelial stratum. The fine pigment granules lie in the protoplasm of the epithelium, not in the nucleus, and are also found penetrating into the depth of the epithelium, forming folds and trachoma glands, which may then be studied much easier. I also found scattered cysts with pigmented epithelium in the connective tissue.

The patches have no pathological importance. They are an interesting, but perfectly indifferent deviation, and especially do not seem to predispose to malignant pigmented tumors. Although I encountered these patches daily for years, I only saw one such tumor, viz.: a small pedunculated pigmented adenoma which I removed with one cut of the scissors. Some oculists in Europe seem to be inclined to remove black spots from the conjunctiva to prevent the development of malignant tumors. If I would do this with the Malay, I would have to excise a piece of conjunctiva of about every tenth patient.

Besides the Malay, trachoma appears to cause the patches in other colored races also. I often saw them in the Chinese. Those coming under my observation are, however, almost all half-breeds, of Malay-Chinese extraction. Recently I noticed one in a full blooded Arabian who had been here only for a short time.

AMBLOPIA FROM CARBON BISULPHIDE POISONING.*

By F. C. Heath, M. D.,

INDIANAPOLIS, IND.

SECRETARY OF STATE MEDICAL SOCIETY, EYE AND EAR SURGEON TO CITY HOSPITAL AND DISPENSARY.

Poisoning by carbon bisulphide is a rare affection, only one case having been reported in this country. Having met with what is probably a genuine case, I deem it wise to report it, after first giving a few points on the subject in general from the limited literature available.

The first reports were made in Paris in 1856 and 1863, by Delpech, giving observations on thirty-three cases, fifteen of which suffered from amblyopia. Later cases were described by other observers in France, Belgium, Germany and England, a committee of the Ophthalmological society of the United Kingdom analyzing about twenty-four in 1886.

The people affected were all workers in rubber factories, a solution of chloride of sulphur in bisulphide of carbon being used to vulcanize the rubber. Experiments of Delpech and the above named committee proved that the poisoning was due to inhalation of the vapor of the carbon bisulphide.

Physiologists and physio-chemists tell us this is a blood-poison, that methaemoglobin is formed and there is disintegration of blood-corpuscles, anesthesia of whole body occurring in acute poisoning and death in fatal cases by paralysis of the respiratory center. In chronic poisoning by this agent, the general symptoms may be divided into two stages: (1) Excitement or exaltation, and (2) depression or collapse.

*Read before the Marion Co. Medical Society, Indianapolis, Ind., October 29, 1901.

Severe headache is often the first symptom, followed by vertigo, irritable temper, hilarity, increased appetite, disordered digestion, nausea, hyperethesia of the skin, creeping sensation, ringing in the ears, sleep disturbed by dreams, pains in the limbs and spasmodic contraction of certain groups of muscles. According to Delpech there may be sexual excitement and Eulenberg saw one case of acute mania which subsided in two days on removal from the noxious vapors.

These symptoms are replaced later by insomnia, dejected spirits, loss of memory, anethesia of skin and mucous membranes, impairment of sexual power, weakness of muscles and cramps. Bernhardt says, a girl of twenty-two after six weeks' work in a caoutchouc factory suffered from mental weakness and digestive troubles, anesthesia and analgesia of the skin.

In advanced cases mental debility is pronounced and there may be emaciation and wasting of the muscles like progressive atrophy or pseudo-tabes. Paralysis of the lower limbs has been noted and in one case the right hand was paralyzed for two months.

Eye symptoms may appear in the first stage, patients complaining of weak eyes and seeing things "veiled in a mist." This fogginess is, however, more frequently found and more pronounced at a later stage. The pupils, then, are dilated but responsive to light, and there is impairment or loss of accommodation with decided lowering of vision—either a central scotoma, color-blindness or peripheral contraction of the field of vision. The central visual acuity may be reduced to counting fingers at three metres or seeing only large type, J. 16-20, (De Schweinitz). Although central scotoma is most common (as in other forms of intoxication-amblyopia), Little and Gunn have reported complete red-green blindness, and Little and Lavigerie no scotoma but contraction of the color fields. Amblyopia is found in about 40 per cent. of cases of chronic poisoning by this agent.

The ophthalmoscope may reveal a normal fundus but more commonly there is pallor of the optic disc on its temporal half, perineuritis, slight neuritis, partial or complete atrophy—or stippling in the macular region.

After death from acute poisoning by carbon bisulphide,

the general pathologic changes are similar to those found after fatal chloroform breathing. The pathology of this affection as regards the amblyopia is an interesting problem. Is it a retrobulbar or axial neuritis, or is the lesion in the retina? This belongs to the class of intoxication-amblyopias of which that due to excessive use of alcohol or tobacco may be taken as a type. It seems improbable that there could be any marked lesion of the optic nerve, inflammatory or degenerative, in the early stages of amblyopia, since a short rest produces marked improvement in vision and perfect recovery often follows withdrawal of the noxious agent. The disturbance, then, is probably vascular, as shown also by the fact that vision becomes better under nitrite of amyl. In the later stages, however, there is a lesion described by some observers as a degeneration of that part of the optic nerve called the papillo-macular bundle; in some cases there seems to be inflammation of connective tissue with secondary atrophy of nerve-fibres, in others primary atrophy of the latter with secondary interstitial changes.

Nuel, on the other hand, contends that the primary lesion is retinal, degeneration of the cells of the macula lutea causing secondary changes in the optic nerve. Birch-Hirschfeld studied the changes in the retinal ganglion cells due to poisoning rabbits with quinin, extract of male-fern and carbon bisulphide, finding in every case "changes in the chromatophilic elements, formation of vacuoles, swelling, shrinking of the nucleus, and finally destruction of the cell." Holden had already shown by experiments on dogs that many toxic substances exercise their primary effect on the ganglion cells of the retina. In those exceptional cases of contraction of the color-field without a central scotoma, the lesion is probably not in the macula.

The diagnosis of this affection rests upon the history of exposure to the influence of the poison with the existence of the symptoms above described.

The prognosis is favorable and recovery rapid if the first stage of poisoning only is experienced, but if mental and muscular weakness and anesthesia of the skin appear, a year has been know to elapse without much improvement and permanent injury to the health may be feared. Reports of ophthalmologists mentioned by De Schweinitz (the

greatest authority on toxic amblyopia) show recovery or marked improvement in 60 to 70 per cent.

Prophylactic treatment is indicated in the form of some specially devised apparatus for workmen in rubber factories to prevent inhalation of the fumes of carbon bisulphide. The medical treatment as in other forms of intoxication amblyopia calls for iodides, strychnia, phosphorus, iron, electricity, massage, and other building up measures.

According to De Schweinitz, Dr. Henry Ring, of New Haven, is the only observer who has reported a case in this country. The details of that case I have been unable to learn. The history of my case is as follows:

Miss T., visited my office early in the summer of 1900, complaining of weak eyes, saying there was a fog before them. Her sight was then about normal, far and near, but the eyes soon tired and the pupils were a litte dilated. She had worked in the Indiana Rubber Company from Jan. 1, 1900, to the last of March, 1900, when she was unable to continue. She spliced the inner tubes of bicycle tires which she washed with bisulphide of carbon and chloride of sulphur solution, from open cans except the last two weeks, then from stoppered cans. She and her mother described her first symptoms as great nervousness, excitability, irritability of temper, and mist before the eyes, followed later by insomnia, cramps, weakness of muscles and emaciation particularly in muscles of forearms, hands and face. There seemed to be impairment of mental powers but whether this and the apparent emaciation were due to the chemical or were natural conditions, it was mpossible to say.

About s.. nths after this I was summoned to testify in a suit for $5,000 damages brought by this patient against the Indiana Rubber Company. Before going on the stand I told her attorney that, on the strength of that brief unsatisfactory examination made so long ago with hardly any positive signs of amblyopia I could not swear that she had amblyopia. He therefore skillfully refrained from asking me a direct question on that point, but, having mentioned it in his complaint he succeeded in creating the desired impression upon the jury, as that was presumably what I was there for. After remaining out nearly two

days, the jury brought in a compromise verdict of $500 for the plaintiff.

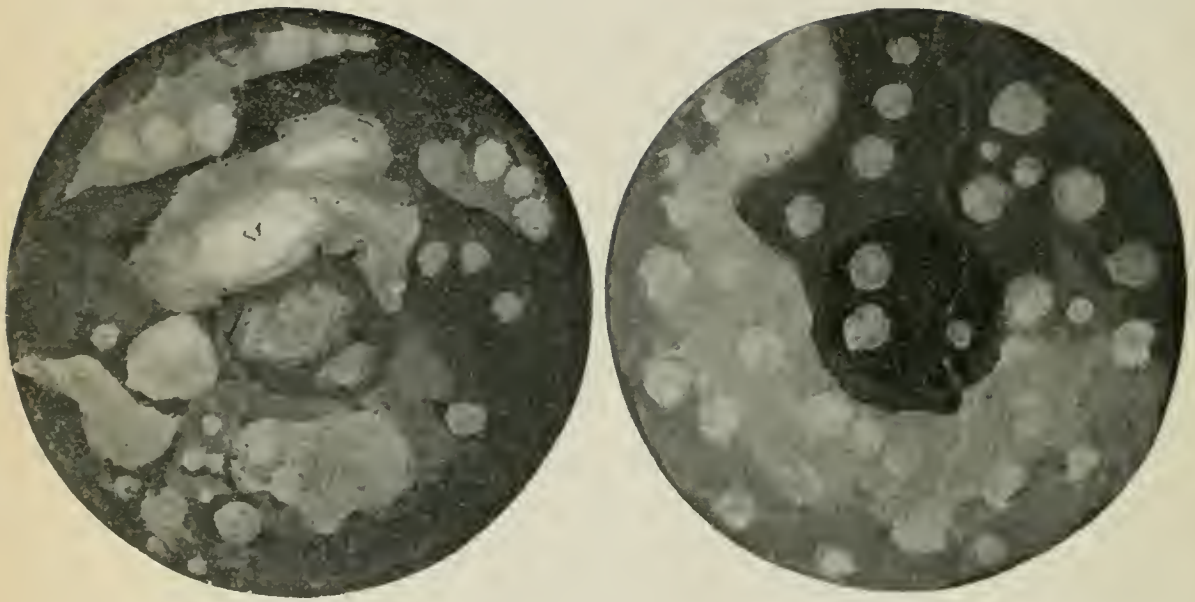
February 21, 1901, a few months after the trial, I examined her again and thought her general physical condition better than on first examination, less emaciation and a little brighter mental action.

Her pupils were more dilated and sight apparently much worse: R.V.15/50 +. L.V.15/50 —. No glass improved vision in either eye. She read J^4 at 9 inches with either eye separataly, J^2 with both together.

The ophthalmoscope showed nothing positlve beyond pallor of the optic disc.

There was no central scotoma but the field of vision was contracted peripherally, somewhat for white and blue, more for red and green, very markedly for yellow. I have never seen her since this second examination, do not know whether she took the medicines I suggested or whether there has been since that any change in her condition for the better or for the worse. She was so desirous of obtaining damages from the company that some malingering may be suspected, but notwithstanding the absence of central scotoma and presence of better vision than in the average case of this form of toxic amblyopia, I am inclined to think that the history and above-detailed symptoms point to a genuine case of carbon bisulphide poisoning.

[Dr. Ring writes me that his case disappeared before he had a chance to fully investigate — he knows the man has become blind and thinks it due to the inhalation of carbon bisulphide in a rubber shop. He mentioned the case to Dr. De Schweinitz but has never put in print on account of data, which makes my case the first actually reported in this country.]



Right Eye. Left Eye.

An Unusual Form of Superficial Punctate Keratitis.

AN UNUSUAL FORM OF SUPERFICIAL PUNCTATE KERATITIS.*

WM. CAMPBELL POSEY, M. D.,

PHILADELPAIA,

PROFESSOR IN OPHTHALMOLOGY AT THE PHILADELPHIA POLYCLINIC AND SCHOOL FOR GRADUATES IN MEDICINE; OPHTHALMOLOGIST TO THE HOWARD HOSPITAL.

ILLUSTRATED.

S. R., colored, aged 25, first consulted me at the Howard Hospital, with the history of having had sore eyes for one month previously. Examination revealed a moderate amount of swelling of both lids with slight injection of both conjunctivæ, the main changes evidencing themselves in the cornea; the cornea in the right eye, in addition to a general haze of the entire membrane, being the seat of a peripheral infiltration resembling a ring ulcer, which was complete, save for a small break in the area of saturation in the lower outer quadrant. The cornea in the left eye was similarly and even more seriously affected, for the infiltrated area was completely annular and the rest of the membrane more densely hazed. Careful examination with a Hartnack loupe, showed that while the saturation of the cornea was most intense, the epithelium was nowhere unbroken, even over the areas of deepest saturation at the limbus. Tension in both eyes was somewhat full, the anterior chambers were deep and the pupils were somewhat dilated (3 1/2 mm.); O. D. V. equaled 5/12, O. S. V. equaled 5/22.

It was ascertained that the patient had been under the care of Dr. W. N. Pollard of Atlantic City for sometime prieviously, but that he had failed to carry out rigorously the treatment which Dr. Pollard had prescribed for him.

Syphilis was denied. The patient admitted, however, having had several attacks of gonorrhea, one attack hav-

*Presented at the Section on Ophthalmology, College of Physicians of Philadelphia, December 17, 1901.

ing manifested itself but one month previously. His health had always been excellent and there was nothing which pointed to a catarrhal condition of the upper air passages.

He said that when his eyes were first affected they had watered profusely but that there had never been any discharge from them of either mucus or pus. The aetiological factor being in doubt, he was placed on high doses of quinin (gr. xv. daily) and admitted to the hospital for active local treatment. Bed was prescribed, frequent flushing of the cul-de-sacs with boric acid solution and the application of hot compresses almost constantly. To contract the pupils and diminish the intraocular tension, eserin was instilled in weak doses (gr. $^1/_{10}$. d. f. ℥i). His bowels were regulated by salines and a liberal diet was afforded him. Upon this plan of treatment the cornea slowly cleared, the infiltration at the limbus lessened and at the end of six weeks there was so little irritation that it was thought safe to discharge him from the hospital. This was done, with a parting admonition that he return at intervals for any necessary treatment.

Nothing further was seen or heard of him, however, until six weeks ago, when he returned desiring readmission to the hospital. He said that his right eye had been inflamed all summer but that he was unable to come to the city on account of pressure of work. Examination revealed (see accompanying illustrations kindly made for me by Dr. W. C. Swindells) that this eye was the seat of an intense inflammation, but of quite a different type from that upon account of which he first sought relief, the infiltration now, instead of involving the periphery, manifesting itself chiefly in the central zone; the entire cornea, however, was densely hazed, to such an extent, indeed, that the sublying iris could be barely discerned. When examined minutely through the loupe, the haze resolved itself into an irregular, thickened, grayish layer of opacity, occupying for the greater part the superficial layer of the cornea. The epithelium appeared to be everywhere intact. There was considerable ciliary injection but the bloodvessels stopped at the limbus. The cornea appeared thinned and was becoming cone-shaped. Tension was normal. No ciliary tenderness. Vision equalled counting fingers

at 10 cm. The left eye was practically quiet, save for a slight area of ciliary injection below. The cornea was slightly hazy near the lower limbus, which the loupe showed to be occasioned by a diffuse subepithelial studding. The patient was placed upon the same treatment that he had had during his previous residence in the hospital, with the addition of the installation of a 1 per cent. solution of holocain into the eyes night and morning. The right eye improved at once, vision in two weeks equalling 5/30, but the cornea of the left eye seemed to grow hazier, the opacity slowly spreading from below until it reached to within a few mm. of the lower margin of the pupil. The rest of the membrane also assumed a dull appearance and the vision which had equalled 5/7½, on admission, sank to 5/20. The treatment, however, was persisted in, with the addition of inunctions of ℈i mercury t. d., and after a few weeks the cornea began to clear, vision returning to 5/10. As shown by the accompanying sketch, the opacity in the left eye is quite superficial and is made up of a series of small round and oval white spots, separated from one another by a series of still smaller grayish white spots.

The points of interest in this case appears to me to be the quite dissimilar appearance of an inflammation undoubtedly of the same type, occurring in the same eye within such a short time, the keratitis taking the form in the first attack of ring ulcers in both eyes, and disappearing without leaving a trace, and in the second of superficial whitish dots and epithelial proliferations upon the surface of both cornea; also the limitation of the disease to the superficial layers of the cornea, notwithstanding the intensity of the process.

Although occurring but one month after an attack of gonorrhea, I am inclined to think that that disease was without influence upon the ocular inflammation, although what the aetiology of the affection is I am unable to say.

"RESIDUAL SENSATIONS" AS A TEST FOR DIPLOPIA OR HETEROPHORIA.

By Wm. R. Broughton, M. D.

NEW YORK CITY.

In the October number of this Journal there appeared an article by Dr. Clinton F.Cooke on "Residual Sensations as a Test for Diplopia with Description of a New Method for Measurement of Ocular Muscle Imbalame;" in which Dr. Cooke endeavors to prove that in some cases latent heterophora may be discovered by these tests of "residual sensations," when the usual tests by the phorometer, Maddox-rod double prism, red glass, etc., fail to show any imbalance of the ocular muscles.

Dr. Cooke's theory is that when one eye is closed, with consequent relaxation of the levator palpebræ muscle, there is less tendency to fusion of images and the closed eye assumes its natural position more readily than when the eye is simply shielded by a screen. If the eye tends to deviate from its fellow, there will be a transcient diplopia on opening the eye and a second image of a candle-flame (or better a luminous point) will be seen to merge quickly into the image seen by the other eye. This diplopia lasts only a fraction of a second, but is sufficiently distinct for an intelligent patient to tell the direction and approximate distance that the secondary image moves. The eye, of course, moves in a direction opposite to that of the image and therefore, when closed, the eye was turned in the same direction that the image moved. From these tests Dr. Cooke draws some very logical deductions, that would be of great value, were the tests themselves reliable.

During my association of the past fourteen years with Dr. Ambrose L. Ranney, this test among many others has been tried in a number of cases and finally discarded as utterly untrustworthy.

If one eye could be closed by simple relaxation of the levator palpebræ, this test would be of some value; but the

closure of one eye without the other requires a distinct muscular effort not only of orbital muscles, but often of the muscles of the face and is a trick that many people (particularly ladies) never acquire.

The deviation of the axis of vision in a closed eye from that of the open eye is due in the opinion of the writer to the pressure exerted upon the globe by the eye-lids in the unnatural effort of closing one eye without closing the other. It requires only a very slight pressure on one eye-ball to produce diplopia in the normally balanced eyes, as any one can demonstrate to himself by sitting 20 feet from a luminous point and pressing very lightly with the finger over the lower lid upon the globe. If the lower lid is moved upward ever so lightly the image of that eye will move downward, producing a diplopia, and showing that the eye has been turned upward by the pressure. Thus by pressure upon different parts of the globe, any form of diplopia can be produced.

The closure of both eyes at once is a natural act and is accomplished more by relaxation of muscles than by muscular effort. When both eyes are closed and suddenly opened, no transient diplopia occurs in a case; where when one eye is closed, it does appear.

When one eye only is closed, a careful observer can see the wrinkling of the skin on the nasal side of the lower lid and the actual raising of the lower lid, producing pressure upon the globe. This is not apparent when both eyes are closed.

In order to illustrate my belief that such tests are absolutely worthless, I will give the tests on my own eyes as a sample of numerous tests on my patients, and I do this because I can apparently close either eye and keep it closed for an indefinite time with much more than ordinary facility.

When, seated 20 feet from a candle-flame, my left eye is closed for a few seconds and then opened, a second flame is seen about six inches below the other and slightly to the right. This flame rapidly runs up into the other flame. Accordingly I should have at least 4° of (latent) left hyperphoria, and my left sursumduction should be at least 4° and certainly more than my right sursumduction; but my sursumduction tests are only 2° for each eye and exactly

the same, nor do I show any hyperphoria by the phorometer, Maddox-rod or any of the regular tests.

Again, when my right eye is closed and suddenly opened, the secondary image moves upward into the candle-flame as it did before; but not to so great a degree. This would show right hyperphoria of less degree, than the left hyperphoria when the left eye was closed.

Have I then anaphoria combined with left hyperphoria (both eyes turning upward, the left more than the right)? If so, by the tropometer I should have upward rotations above normal and downward rotations less than normal; but the upward rotation on each eye as measured by the tropometer is only 30°, certainly not above normal.

Therefore I cannot prove my "residual sensation" test by any other test and my case is but one of many cases that I have tried this test upon.

Not long ago a patient with chronic chorea who had tried every known treatment for chorea and who had a firm belief that his eyes were the cause of his trouble, came to me in great glee because he had discovered that he had four degrees of hyperphoria.

Several years previousy he had been operated upon for esophoria with perfect result and had shown no heterophoria on repeated tests for some years. It seems he had discovered the doubling of a spot on the wall when he opened one eye that had been closed and had for himself figured out just how much one eye should be higher than the other. Great was his disappointment when I could not find hyperphoria by any other test and explained to him the fallacy in his test.

No one test for imbalance of ocular muscles is of distinct value unless confirmed by other tests and no case of muscular eye-defect can be considered solved until all tests are brought into accord.

Before prisms are given for permanent wear, or tenotomy is performed, all balance tests should be proved correct by a corresponding difference in the strength of the ocular muscles, i. e., all heterophoria must be proved by the duction tests or by the tropometer. For example exophoria is not genuine unless the abuction is above 8° nor is hyperphoria genuine without some coresponding difference in the sursumduction.

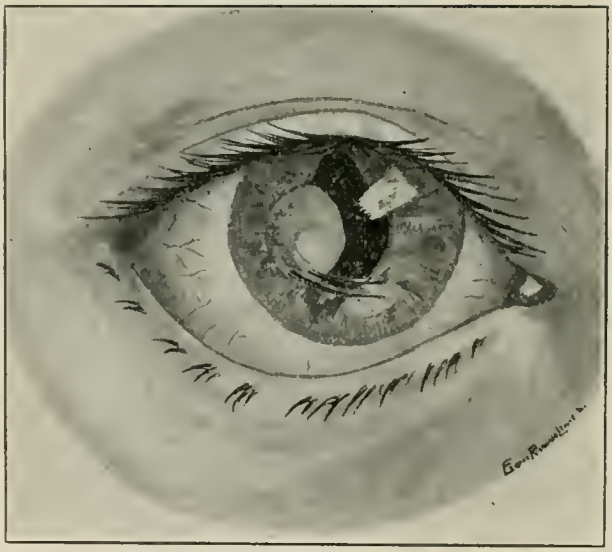
The establishment not only of single vision but of absolute muscular equilibrium in a pair of strabismic or badly balanced eyes is one of the most complex and scientific achievements of modern surgery and all tests that aid in arriving at definite conclusions or that help us in disclosing latent muscular errors should be welcomed; but this test seems to the writer to be so inaccurate that the results are far more often misleading than helpful, especially to beginners in muscle work, and therefore this article by Dr. Cooke should not be allowed to pass without criticism.

OPACITIES OF THE V TREOUS AND AMENORRHŒA.

Dr. R. Bylsma.

MIDDELBURG, NETHERLANDS.

Miss N., aged 16, consulted me on account of muscae volitantes that troubled her especially in the evening. The eyes appeared normal, vision in each eye 6/6. She reads Sn. 0.5 easily, her refraction is E. The ophthalmoscope reveals many large and small spots in the vitreous of the right eye, that move about freely and also a couple of spots in the vitreous of the left eye. The retina and choiroid appear normal except for a slight anaemia. The color perception and the field of vision are also normal. She had not menstruated for the last three months. Her heart and kidneys are normal. The girl is tall, thin and slim and has a chlorotic appearance. Her appetite is poor. A relation between the amenorrhea and the eye trouble is therefore probable. A tonic alterative treatment is prescribed. Ferric Iod., milk, eggs, regulating the bowels, daily exercise in the open air, stimulating hip baths three times a week and diaphoretics. Rapid resorption followed this treatment but as the menstruation did not appear at the fourth and fifth months, there was a temporary increase of the opacities at those times. My opinion as to the origin of the trouble was hereby strengthened and I ordered the same treatment continued. Indeed the success was complete, when after three weeks menstruation appeared and has since been regular, simultaneous with which the opacities disappeared very quickly, so that at present, after eight months, only a few small ones are visible in the right eye, which do not cause any trouble to the patient.



A REPORT OF A CASE OF DERMOID CYST OF THE IRIS NOT PRECEDED BY TRAUMA.

By Albert C. Snell, M. D.,

ROCHESTER, N. Y.

OPHTHALMIC SURGEON TO THE HOSPITAL OF THE NEW YORK STATE SAILORS' AND SOLDIERS' HOME, BATH, N. Y.

ILLUSTRATED.

Mrs. W., 32 years of age, applied for admission to the Wills' Eye Hospital, Philadelphia, in May, 1899, and came under the care of Dr. W. W. McClure by whose courtesy I am permitted to report this case.

About five years previous to her admission the patient had her attention called, for the first time, to a small yellow spot on the iris of the right eye. At this time the eye did not cause her any trouble, and she believed her vision was equally good in both eyes. During the succeeding four years the eye remained perfectly quiet and had caused her no anxiety, but she had observed that the yellow spot was gradually becoming larger. During the year preceding her admission, however, the patient had had two attacks of pain, the eye becoming at these times inflamed, and, at the time of her admission, she was suffering from a third attack which was so severe that she was compelled to seek professional advice.

Repeated and careful questioning failed to elicit any history of her having received even the slightest injury to the eye, and there was found no scar in the cornea nor the slightest evidence of any previous trauma or inflammation of the globe.

The first examination showed that the bulbar conjunctiva was slightly congested; small conjunctival vessels were distended and tortuous; tension was + 2; and vision was reduced to perception of light.

The iris presented a very striking picture. Apparently growing from it and partly incorporated into it was an oval,

pearly white mass, 6 mm. long and 4 mm. wide. This extended nearly transversely from the base of the iris on the temporal side to the center of the pupil, with the apex of its anterior wall lying against the posterior surface of the cornea by which it had been flattened out. Projecting from the lower temporal quadrant of the cyst, two hairs, dark brown in color, were very conspicuous. One of these extending obliquely downward and toward the nasal limbus reached the lower, inner angle of the anterior chamber; its distal end being in contact with the cornea. The other lying nearly horizontal extended to the lower pupillary edge; its distal lying free in the anterior chamber. The longer of the two hairs measured 10 mm., the shorter one 5 mm.

The cornea was perfectly clear and transparent even where the cyst lay against its posterior surface, except a comet-like opacity 15 mm. in extent, which marked the place where the longer hair had imbedded its distal end into the deeper layers of the cornea.

The iris was pushed forward and partly into the pupillary opening so that the anterior chamber was shallow and the pupil bean-shaped and very much distorted. To the temporal side, between the base of the ciliary body and the cyst, the iris 3 mm. in extent had been torn away from its attachment to the ciliary body, leaving a crescentic coloboma through which a dull, red reflex was obtained with reflected light from the ophthalmoscope. The iris retained its healthy color, but pupillary action was absent or very slight.

The lens was found to be opaque and no fundus reflex was obtained through the pupil.

As the eye was now blind and caused the patient intense pain, an enucleation was advised to which she consented and the operation was performed under ether.

The eye-ball was placed in 10 per cent. formalin and three weeks later it was divided at its equator and each half separately mounted in glycerine-jelly after Priestly Smith's method. The anterior half which I removed from the glycerine-jelly in July, 1901, in order to section and mount for microscopical examination, I found fairly well preserved. A section was made through this part of the globe, corresponding with the long axis of the cyst, di-

viding it into two parts. This revealed that the cyst lay partly in front and partly behind the iris, by which it was constricted so that it appeared quite like a flattened hour-glass, the anterior sacculation being the larger. The posterior sacculation was pressing against the lens which was at least two-thirds absorbed leaving only a few whorls of lens substance between it and the vitreous.

The cyst was completely filled with a pultaceous mass which, microscopically, very much resembled Neufchatel cheese both in color and consistency. The part which contained the hairs was carefully dissected from the surrounding tissues from which it was easily separated, except in a small area, above and to the temporal side, in the region of the circuslus arterious iridis major, where it was firmly attached to the iris. In this area another short, thick hair was found extending through the base of the ciliary body and having its apex bent on itself where it came in contact with the sclera. The ciliary body was otherwise not involved. Two colorless lanugo hairs could be seen with a ten-inch magnifying glass, and all these five hairs had their roots close together in the region of the adhesion which formed the pedicle of the cyst and indicated, I believe, the starting point of the cyst's growth. These hairs showed no signs of maceration.

Microscopical examination of sections made from the remaining half of the cyst showed that its walls were composed of an external connective tissue layer and an internal epithelial layer. The latter consisting of several layers of flattened cubical cells. The cells lying next to the connective tissue layer had their nuclei clearly stained and were fairly well defined; while those lying more centrally, quickly lost their cell characteristics, the stain rapidly fading toward the center of the cyst which was filled with cell debris. The posterior wall of the cyst showed the presence of some iris tissue lying in widely detached islands, which in places was deeply pigmented. This condition was entirely absent in the anterior wall.

A view of the posterior half of the globe shows that the optic disc was widely and deeply excavated. The attacks of pain which the patient suffered prior to her admission were probably due to the secondary glaucoma which the cyst had produced.

Many interesting theories have been evolved to account for the pathogenesis of cysts of the iris. The Buhl-Rothmund theory which is the one most generally accepted holds that epithelial cells from the cornea, conjunctiva or lids are carried into the anterior chamber by a penetrating object and these cells are then deposited on the iris where they continue to proliferate, having found favorable conditions for their nutrition and life processes. A cilium with its follicle may in like manner be transplanted from the lids to the iris; as in the interesting case reported by Schweigger[1] in which he describes six cilia growing in the iris where they had been carried by a penetrating object. Oppenheimer[2] more recently reports a case of cilium in the anterior chamber following a wound made by a wire striking against the eye. The rationality of this implantation theory was proved by the experiments of Doremaal,[3] Goldzeiher and others who have succeeded in causing transplanted epithelium to grow in the iris. By far the greater number of cysts of the iris are preceded by penetrating wounds and this theory affords a very satisfactory explanation for such cases.

However in regard to the pathogenesis of those rarer cases in which there has been no trauma preceding the development of a cyst, authors have greatly differed.

De Wecker[4] thinks that non-traumatic cysts may be caused by posterior synechia, a closed sac being thus formed in the posterior chamber in which fluids accummulate. Alt[5] holds that anterior synechia may produce cysts in the same way. Everbusch[6] has advanced the idea, which has had a large number of followers, that a cyst may be caused by a hemorrhage into the tissues of the iris. The hemorrhage separating the layers of tissue into walls, forms a closed sac, which continues to dilate by extravasation and retention of fluids within its walls.

Schmidt-Rimpler[7] believes that the orifices of the crypts which are normally found in the anterior surface of the iris may become occluded and form retention cysts. Cysts formed in this way, however, should be lined with endothelium.

More recently, authors[8] have considered that these non-traumatic intraocular cysts are of embryonal origin, being the result of some error of development. During the

invagination of the ectoderm to form the secondary optic vesicle, epithelium becomes included in the surrounding mesodermic tissue and later in life proliferates and develops into a cyst. This case which I have described I believe was congenital and this later theory seems the most rational way to explain its genesis. In the dermoid tumors of the anterior mediastinum and in other parts of the region of the branchial clefts we have the analogue of the dermoid cyst of the iris and these are very generally considered to be inclusion cysts.

The special points of scientific interest presented by this case are:

I. Its evident congenital origin.

II. Its rarity; the cases of dermoid cyst of the iris not preceded by trauma being exceedingly rare.

III. It beautifully illustrates the complete circle of events which are very likely to occur when these cases are allowed to run their full course—at first a slow growth without the appearance of any symptoms; then loss of vision from opacity of the lens produced by the pressure of the cyst against it; destruction and absorption of the lens and finally secondary glaucoma with its usual symptoms and sequelæ, complete destruction of sight and pain so severe that enucleation, as a last resort, may be necessary.

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ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC LITERATURE

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The Diagnosis, Prognosis and Treatment of Pernicious Myopia.

SMITH, PRIESTLEY, Birmingham, Eng. (*Brit. Med. Jour.*, Oct. 19, 1901.) In attempting to predict the course of myopia, the writer says, we must carefully consider many factors and possibilities. He classifies the chief data on which to base a forecast as follows:

1. Age of patient—other things equal, the younger the patient the more likely is the myopia to increase in degree. 2. Degree of myopia—other things equal, the higher the myopia the more likely it is to increase. 3. Condition of choroid and retina—the higher grades of myopia are to be feared far less for the error of refraction, which glasses can correct, than for loss of vision due to choroidal and retinal changes for which there is no remedy. 4. Constitutional condition—it is clear that constitutional disease may be a factor in any case of myopia. It may account for the abnormal yielding of the sclera; it certainly often aggravates the morbid changes in the choroid and retina. 5. The evidences relating to heredity—the tendency to myopia is very frequently hereditary. Hereditary myopia, even of high degree, is sometimes of remarkably innocent type. But heredity confers no immunity from pernicious complications. 6. Occupation—prolonged and habitual

close work does harm. Excessive close work in early life is often accompanied by rapid increase of refraction; in later life it often aggravates the graver complications. To continue such work in excess and to decline to increase the working distance by glasses is to encourage a pernicious course. In conclusion, Smith says we should suspect every myopia, especially in youth, of a tendency to increase, until time has proved it to be stationary; to be doubly suspicious in the presence of congestion or atrophy; and to re-examine at frequent intervals, because we can do more by way of prevention than cure.

Periscopic Lenses.

PERCIVAL, A. S., Newcastle-on-Tyne. (*British Medical Journal*, Oct. 26, 1901.) The writer finds that for powers higher than + or — 10 D it is impossible to grind glasses of such a shape as will allow eccentric vision at 25 degrees to the axis to be as good as direct centric vision; but up to this limit he has solved the problem. Periscopic lenses in higher powers than + or — 10. D, although not perfect, are much more nearly so than ordinary bispherical lenses.

Table of radii of curvature for some periscopic lenses, when the refractive index of glass is 1.54.

Power	r_1	r_2
	mm.	mm.
+ 20 D	— $17^{41}/_{77}$	— 50
+ 15	— 20	— 45
+ 12	— $22^{1}/_{2}$	— 45
+ 10	— $24^{6}/_{11}$	— 45
+ 8	— 30	— 54
+ 6.5	— $37^{1}/_{2}$	— $68^{28}/_{79}$
+ 5.	— 54	— 108
+ 2.	— $64^{4}/_{59}$	— 84
— 2.	— 102	— $74^{1}/_{31}$
— 5.	— $174^{6}/_{31}$	— $66^{2}/_{3}$
— 8.	— $843^{3}/_{4}$	— $62^{1}/_{2}$
— 10.	+ 1,512	— 56
— 13.	+ 1,512	— $42^{42}/_{59}$
— 15	— 612	— 34
— 17	+ 1,512	— $32^{104}/_{233}$
— 20	+ $172^{4}/_{5}$	— 32

After discussing the principle on which his calculations are based Percival gives a curvature chart. This table

shown below, gives the radii of curvature of the surfaces of lenses between + 20 D and — 20 D. The symbol r_2 is the radius of curvature in mm. of the surface next to the eye; the preceding negative sign shows that this surface is always concave toward the eye. On the other hand, r_1 is the radius of curvature of the surface facing the light. From the preceding sign it is seen that this surface is convex toward the light (or concave toward the eye) except in four cases.

Consideration of the periscopic effect, the writer says, will determine how to correct a given case of mixed astigmatism. For instance, suppose that a patient has $+ \pm \frac{2.5}{2.5}$, which can be corrected either by + 2.5 D sph. ⊃ — 5 D cyl. ax. horizontal, or by — 2.5 D sph. ⊃ + 5 D cyl. ax. vertical. Clearly the latter will allow of a greater lateral ranging movement of the eyes provided that the concave surface is next the eye, which is of greater importance than an increase in the vertical field of view. In compound astigmatism it will be necessary in most cases to grind a concave spherical surface on one side, and on the other the requisite toric surface. In conclusion the writer says that glasses of this pattern, which he has ordered for patients, have given complete satisfaction.

The Treatment of Strabismus Other Than Operative.

JACKSON, EDWARD, Denver, Colo. (*Jour. A. M. A.*, Oct. 26, 1901.) The writer says: "The non-operative treatment for strabismus includes the entire treatment of many cases, and the earliest treatment for all. The indications to be met by it are: 1, to bring about normal innervation of the muscles concerned in ocular movements, by the removal and exclusion of abnormal requirements, and abnormal overflow impulses; 2, to place and keep the eyes, so far as possible, upon the best plane of visual acuteness and an equality of required effort; 3, to eradicate abnormal methods of using the eyes, especially dependence upon one eye to the practical exclusion of the other; 4, to develop normal binocular vision—the method of combining the visual sensations produced by the two eyes, and the habit of employing them both in all ordinary seeing."

He classifies the things to be accomplished in the treatment of strabismus thus:

1. "The removal so far as possible of all obstacles to binocular vision. Under this head falls the operative, with a very important part of the non-operative treatment. 2. The establishment of binocular vision. 3. The perfecting of binocular vision. The latter two are to be effected wholly by the non-operative treatment."

Jackson emphasizes the very important practical role played by the use of proper correcting lenses, which should correct all the ametropia. To determine the latter, cycloplegia is always required. He says that failure to rightly employ lenses is the most common cause of failure to cure strabismus. The writer then speaks of the use of the previously deviating eye and says that, in the majority of cases, this is the first point to be effected. The occlusion pad or bandage, which completely excludes the better eye, is the only thing that will serve the purpose, if the vision of the squinting eye is very much reduced. The use of this pad should be continued until, if this be possible, the worse eye is used for fixation when the other is kept under a cycloplegic. Cycloplegia may be continued after the correction of ametropia. especially in the good eye in monolateral squint, where it may compel the use of the previously deviating eye. If it does not do so the pad must be used.

Exercises for the development of binocular vision must be used, and, in young children, the fusion tubes of Priestley Smith are of especial value. Next in value to these tubes Jackson places Worth's modification of the reflecting stereoscope. He concludes his paper with a description of the uses of the ordinary stereoscope and reading bar.

The Strabismus Operation.

CLARK, C. F., Columbus, O. (*Jour. A. M. A.*, Oct. 26, 1901.) The writer points out the great difference of opinion existing among ophthalmic surgeons as to when and how to operate for strabismus, and discusses the views of several well known operators. He is convinced that advancement, or resection combined with a very limited tenotomy, should as a rule, be substituted for simple tenotomy. Clark performs his advancement as follows:

"After making a vertical conjunctival incision as long as, and one or two millimeters behind the insertion of the tendon, I make in Tenon's capsule two short cuts with

the scissors parallel with and a short distance above and below the tendon and extending from its point of insertion backward to a distance equal to the amount of shortening desired. The central blade of the hook is now inserted below and made to include the tendon and that portion of Tenon's capsule which covers it and by turning the milled head this central hook with the tendon and overlying capsule is drawn up between the other two blades to such a distance as may be desired. Interwoven sutures are then inserted, firmly stitching the two surfaces of the folded tendon together, after which the hook is removed, the apex of the fold cut away with the scissors and the conjunctival wound closed with fine silk sutures."

The same divergence of opinion exists as to the proper after treatment, some prefer to keep the eyes open to practice orthoptic exercises during healing, others keep both eyes bandaged, often keeping the patient in bed for six days. The writer's course lies midway between these extremes.

Strabismus; Its Treatment.

DAVIS, A. EDWARD. (*Jour. A. M. A.*, Nov. 2, 1901.) The writer, after a general discussion of some physiological points, tests for strabismus, non-operative treatment, operative treatment, with their respective results, arrives at the following conclusions:

1. That it is desirable that we have a uniform or standard set of tests for the accurate measurement of strabismus.

2. A better understanding of the physiological action of the ocular muscles and of physiology in general, than at present obtains, should be had by those treating and operating on stabismus cases.

3. The amblyopia present in most cases of convergent strabismus is functional and acquired, and not congenital except in rare cases.

4. The non-operative treatment of strabismus—atropin, the exclusion pad, and, in patients old enough, glasses, the stereoscope and bar-reading—should be begun as soon as the squinting is observed; for, it is in the early cases that this form of treatment is capable of doing so much good. By means of it, if the case is taken in time, false fixations and suppression of the image in the squinting

eye are prevented, fusion of the images encouraged, and form-perception, that is, true binocular single vision often maintained. Even where one or more of these functions have been lost persistent effort in the non-operative method of treatment frequently restores them.

5. About 30 per cent. of all cases of strabismus may be cured by non-operative treatment alone.

6. Just as soon as the non-operative method of treatment ceases to improve the condition of the squint, it is time to operate. Delay in operating after this is not only useless but harmful, because the habit of suppressing the image in the squinting eye becomes fixed and the amblyopia worse.

7. After the eyes have been operated on, the use of the stereoscope, bar-reading, the pad, glasses, etc., are of the utmost use in completing the cure.

8. Panas' method of operating for strabismus by stretching the muscles before cutting them is to be recommended as safe in execution, quick in results and efficient. It should never be performed while the patients' eyes are under the influence of a mydriatic.

The Cosmetic and Visual Results In Squint.

Ray, J. Morrison, Ky. (*The Jour. A. M. A.*, Nov. 2, 1901.) The writer has addressed himself to a practical consideration of the visual as well as cosmetic effect gained by the different methods of treatment of squint. To do this he has selected 100 cases of convergent strabismus that have been under his personal care, excluding all cases where a visible diseased condition of the eye existed. Each case has been under observation for several months. After discussing the results obtained in these cases, Ray concludes his paper with the following summary of points which he emphasizes:

1. The effect gained in the treatment of strabismus, whether parallelism of the visual axis be obtained by a cycloplegic, glasses, orthoptic exercise, or an operation, is largely, or we might say, wholly cosmetic.

2. Glasses should be adjusted to the eyes of squinting children at as early an age as possible, depending upon the ability of the parent to control the child; and they should always be worn for a sufficient length of time to determine

their effect upon convergence, before any steps in the way of an operation are undertaken.

3. The use of the exclusion-pad and orthoptic training are advisable, not so much in the hope of increasing the vision in the squinting eye, as to improve the power of co-ordination in the recti muscles, so that when the child reaches the proper age for operation the power of simultaneous muscle action will not have been lost.

4. Binocular single vision is not present in more than 7 per cent. of cases of squint, and its production in a larger percentage uncertain and unsatisfactory. Parallelism of the visual lines does not mean binocular single seeing.

5. Double images are not necessary for a successful issue. Cosmetic results can be obtained and maintained where the fusion power is absent. This is true in monocular squint with great amblyopia as well as in the alternating form.

6. Congenital amblyopia is often found in eyes that do not squint, especially combined with hypermetropia and astigmatism, and often in members of a family where squint in others is present.

7. In alternating squint if the hypermetropia is of a high degree the chances for producing parallelism are better than when the hypermetropia is low. In alternating squint with hypermetropia of a medium degree the necessity for an operation and the difficulties of producing parallelism by tenotomy are greater than in monolateral squint.

8. The effect of a tenotomy is greatly influenced by the amount of abducting power present in the corresponding externus. This should always be especially noted in the alternating variety.

9. Two tenotomies on the same internus is bad surgery, since it invariaby leaves a sunken caruncle and later divergence.

10. From a cosmetic standpoint the correction by operation is not as simple as might be supposed. What is gained by straightening the eye, if there is left a noticeable exophthalmos with limited motion of the eye both outward and inward?

The Relation of Gonorrhea to Disease of The Eye, (Excluding Purulent Ophthalmia).

LAWFORD, J. B., London, Eng. (*British Medical Journal*, No. 2, 1901.) After discussing the more general pathological relationships of gonorrhea the writer says that, while it is an established fact that the gonococcus is the active agent in the production of the usual lesions of gonorrhea, so far as the genito-urinary tract is concerned, its role in the systemic infection is less fully determined and is more difficult to define. In some cases of the latter the gonococcus has been demonstrated in the blood, synovial fluid, exudation around joints, endocardium and other tissues. In other similar cases examination has failed to detect its presence, and in others again there has been evidence of a mixed infection. He is not aware that the gonoccus has ever been detected within the eyeball, except in cases of gonorrheal ophthalmia with perforation of the globe.

Lawford believes that the "materies morbi," whatever its nature, attacks the various structures independently, and that the simultaneous occurrence of arthritis and endocarditis or iritis is, in a sence, accidental—not necessarily associated. Gonorrheal poison, like that of most infectious diseases, has certain seats of election in the tissues, and it is, the writer says, in no way surprising that evidences of the poison should appear in several such tissues at or about the same time.

The ocular affections which are known to occur in association with gonorrhea (excluding purulent ophthalmia) are a form of conjunctival inflammation—metastatic conjunctivitis—scleritis and episcleritis, iritis, iridocyclitis and neuro-retinitis. Suppurative keratitis has been described in cases of a severe pyaemic character.

The above lesions are much more common in the male sex. The frequency of ocular lesions in gonorrhea is difficult to gauge—Fournier found them in 15 out of 39 cases. The older observers considered all distant symptoms in gonorrhea to be metastases while, after the discovery of the gonococcus, all cases of conjunctivitis were ascribed to inoculation. Lawford believes the origin and nature of the milder form to be quite uncertain.

Gonorrheal iritis, in a large majority of cases, occurs con-

comitantly with arthritis. Its onset may precede that of joint inflammation, or may occur in cases without arthritic complications. Fournier states that in a series of cases he found the eyes and joints not usually simultaneously affected. It has been suggested that gonorrhea may be the cause of iritis developing for the first time long after all local and general signs of the former have disappeared.

The writer is skeptical as to whether this idea is justifiable or indeed reasonable. He has not seen females affected with gonorrheal iritis, and he considers the salicylates of some service in these cases.

Among the less common eye affections attributed to the poison of gonorrhea are retinitis and neuro-retinitis. A few cases of the latter complicating or following gonorreea have been recorded, recovery following. In one of these a recrudescence of the gonorrhea was accompanied by a relapse of the retinitis. Bilateral dacryoadenitis has also been reported.

On the Comparative Value of the Various Preparations of Silver in Ophthalmic Work.

HARTRIDGE, GUSTAVUS, London, Eng. (*British Medical Journal*, Nov. 2, 1901.) Efforts have been made to introduce some salt or compound of silver which may be as efficacious as the nitrate, while free from its disadvantages. The following compounds have been supplied: Actol, itrol, argonin, argentamin, nargol, largin and protargol. *Actol* has no advantage. *Itrol* (soluble in water 1:4000) may be used as a powder directly to conjunctiva; it appears to be an excellent antiseptic with considerable penetrating power. *Argonin* is inferior to both protargol and largin. *Argentamin* has the disadvantage of containing a very small amount of silver (2.6 per cent.) *Nargol* may be used in 5 or 10 per cent. solutions which cause no pain when instilled into the conjunctival sac, and is pleasanter to use and less sticky than protargol. Hartridge considers it worthy of further trial. *Largin* is not precipitated by albumen and chlorides, must be protected from the light and freshly prepared. Its chief claim is that it contains more silver than any other synthetical preparation (11.8 per cent.) In acute contagious conjunctivitis, due to the Weeks bacillus, the writer has had better results than with any other drug. This preparation will stain the conjunctiva

and it is, therefore, unwise to continue its use longer than two or three weeks at a time. *Protargol* (8.3 per cent. silver) is not decomposed by albumen, alkalies, or weak hydrochloric acid; it should be protected from the light and freshly prepared. A 10 per cent. solution of protargol equals in its germicidal effects a 2 per cent. solution of silver nitrate, but it has a much greater penetrating power and can therefore exert its germicidal qualities longer than the silver nitrate. Protargol has no caustic action and causes little or no pain. The writer has had better results with 10, 20 and 30 per cent. solutions than with weaker ones. He has used it in 50 per cent. solution for trachoma soon diminishing secretion and shortening the duration of the disease.

A Note on the Treatment of Hypopyon Ulcers of the Cornea.

HERBERT, H., England. (*Ophthalmic Review*, November, 1901.) The writer says his personal experience is in favor of attacking the cause of the high tension with as much atropin as the patient can stand, at the same time relieving the tension temporarily with the knife. That atropin alone may give relief in some of these cases is certain. He then cites a case so relieved and adds that when the cautery has to be used plus tension is relieved by puncture, generally crucial, through the base of the ulcer, after cauterization. Otherwise the paracentesis usually consists in a small subconjunctival sclerotomy. It is recognized that paracentesis is simply to relieve tension, and not to get rid of the pus. In other respects, he says, the lines of treatment are orthodox. Almost absolute reliance is placed on the galvanic cautery in early ulcus serpens.

A Case of Endothelioma of the Lacrimal Gland (Myxo-Chondro-Endothelioma Cylindromatodes), With an Analysis of Previously Reported Cases of Lacrimal Gland Tumors.

WARTHIN, A. S., Ann Arbor, Mich. (*Archives of Ophthalmology*, Nov., 1901.) The writer gives the history of a case, describes the gross and microscopical appearances and discusses the diagnosis. He gives a historical sketch with a review of 132 cases. In conclusion, Warthin says:

"1. The great majority of the lacrimal tumors described in literature under widely differing heads are most prob-

ably mixed tumors of endothelial origin similar in structure to those of the parotid and submaxillary glands. These tumors form a type peculiar to the serous glands and differ from the endotheliomata found in other parts of the body in their tendency to form cartilage, hyalin, and myxomatous tissue, and in their relatively slight malignancy. 2. Histogenetically they arise from the flattened endothelium of the lymph-spaces, and hence are called endotheliomata, but their peculiar characteristics warrant the employment of some special designation. The use of the term endothelioma in itself appears somewhat misleading in view of the fact that endotheliomata elsewhere are of the nature of sarcoma and are for the greater part very malignant. These growths partake more of the nature of mature connective tissue tumors. The designations, myxochondroma endotheliale, chondroma endotheliale, etc. might be employed, as the case warranted, to indicate both histogenesis and structural characteristics of the growth in the absence of any specific term for the cells lining the tissue-spaces or the tumors derived from them.

Descemetitis a Symtom of Inflammation in any Portion of the Uvea.

BRUNS, HENRY D., New Orleans, La. (*Archives of Ophthalmology*, Nov., 1901.) The writer submits this proposition: "First, that the older writers recognized a distinct, separate, or specific disease which they called by the names Aquo-Capsulitis, Descemetitis, Keratitis Punctata, or Serous Iritis, and that the modern text book writers have nowhere boldly and definitely defined and corrected this error. Secondly, that there is no such disease as the Aquo-Capsulitis of the older, or the serous iritis of the later authors; the so-called disease not being a pathological entity but merely a set of symtoms due to inflammation that may have its seat in any part of the uveal coat." He then gives a resume of the literature upon the subject from Wharton Jones (1847) to Jackson (1900) and gives the histories of some thirty-six cases, several of which he discusses in some detail.

Bruns closes his paper with the following conclusions: "1. There cannot be any such disease as Serous Iritis." It is equally impossible to conceive of a Serous Cyclitis or Choroiditis. 'Simple' Cyclitis would seem to be a term of

evasion. 2. Descemetitis, upon which the diagnosis of serous iritis was long made to rest, is a symton which sometimes appears as an accompaniment of a focus of acute inflammation in the iris, ciliary body, or choroid. 3. Descemetitis may also appear in cases of uveal disease so slight and evanescent that we are unable to determine in what portion of the membrane the focus may be situated; in such cases we cannot make our diagnosis more precise than is indicated by the term incipient uveitis. 4. Descemetitis appears also in certain cases of subacute or chronic uveitis, in which it is impossible to determine the precise site of the focus, but such inability by no means justifies the diagnosis of simple, subacute, or chronic cyclitis. 5. More exact and extended observation will, probably, show Descemetitis to be most frequently the principal symptom of the outbreak of an acute plastic (exudative) choroiditis, this being overlooked because too few cases of iritis or cyclitis are subjected to careful ophthalmoscopic examination after recovery and the complete disappearance of vitreous opacities. 6. Many cases, not to be distinguished clinically from such cases of acute plastic choroiditis, show upon examination with the ophthalmoscope after complete recovery and clearing of the vitreous, no evidence of lesion in the choroid: in these it is reasonable to suppose the choroidal focus to be so peripheral as to be out of the field of observation with the instrument. 7. Plastic (exudative) choroiditis, often appears under the clinical picture of the so-called serous iritis, but such cases usually present themselves for observation after the stage of circumcorneal injection and Descemetitis has passed away.

Anisometropia.

DUANE, ALEX., New York. (*Archives of Ophthal.*, Nov. 1901.) The writer gives the histories of thirty-nine consecutive cases in which he has applied a thorough-going treatment, the results of which have been ascertained. Duane, in conclusion, makes the following deductions:

"1. In the large majority of cases of anisometropia, even those in which the difference in refraction exceeds 2 D, *the full correction can be applied with success*, provided the patient is warned that it may take him one or two weeks to get accustomed to the glasses, and that during this period

he must use them steadily. 2. In many instances temporary discomfort is produced by the glasses, but in the majority of such cases the discomfort soon disappears, if the glasses are steadily worn. The period of time that it takes a patient to get used to the glasses so that they no longer give discomfort, varies from a few hours to one or, it may be, two weeks. 3. After the patient has become accustomed to the glasses, they are not only worn with ease and satisfaction, but also often relieve important symptoms, which glasses not compensating the anisometropia do not relieve. 4. It is especially important to apply the correction when there is a beginning squint, which is evidently due to the anisometropia. Yet it is in these very cases that we may expect difficulty in the acceptance of the glasses. 5. The causes of temporary or permanent discomfort in using glasses are: (*a*) Either the strength of the glass, *per se*. (*b*) The unequal prismatic action of the unequally strong glasses. (*c*) The presence of a muscular deviation producing diplopia. The glasses in this case by enhancing the distinctness of the double images, force them more upon the patient's attention, and hence give more trouble than when seen without the glass. 6. The statement that glasses correcting anisometropia cause trouble by producing retinal images that are of a different size in the right eye and in the left is probably fallacious. 7. In anisometropia there is a moderate tendency for the right eye to be the more refractive of the two. In my cases, the right eye was the more refractive in fifty-eight per cent., and, counting only the cases of high anisometropia, it was the more refractive in sixty-four per cent. 8. In anisometropia the proportion of cases in which the right eye is the more ametropic about equals those in which the left eye is the more ametropic. 9. Anisometropia is very frequently conjoined with muscular anomalies, and particularly (forty-one per cent. of my cases) with divergence (exophoria). In the cases that I have examined, convergent deviations were less than half as frequent as the divergent. 10. In anisometropia of low degree there is no special tendency to the development of hyperphoria. In high anisometropia, hyperphoria is unduly frequent (occurring twice as often as in low anisometropia).

11. The proportion of cases with squint (especially di-

vergent squint) is high, cenvergent squint being found in eleven per cent., and divergent in fourteen per cent. of my cases."

The Treatment of Xanthoma of the Eyelids.

LEVISEUR, FRED. J. (*Med. Record*, Dec. 7, 1901.) In cases of superficially located patches, the writer says, excision is efficient; but if practiced on large or deep seated spots it is liable to be followed by a scar, or even ectropion. It is also difficult to remove all the tissue at once.

Electrolysis, Leviseur says, is free from the disadvantages which attend the use of the Paquelin galvano-cautery and caustics. It attacks the deposits of degenerated tissue and its action is strictly local and at all times under perfect control. There is but little pain. To reach the xanthoma deposits, it is necessary to introduce the needle horizontally with the skin. The current should be very weak at first and gradually increased—a current of 2-3 milliamperes is sufficient, but must be continued for about thirty seconds. It is hardly possible to remove the larger spots at one sitting, but two or three are usually sufficient. No dressing except a little dusting powder is required. The patient should not rub or wash the parts treated. A firm scab forms as early as the second day and, in some cases, takes some time to drop off.

The Value of Excision of the Superior Cervical Sympathetic Ganglion in Glaucoma.

SUKER, G. F., Chicago. (*Jour. A. M. A.*, Dec. 14, 1901.) The writer, after a general review of the subject, thus sums up the most pertinent facts:

1. Sympatheticectomy is a justifiable operation.
2. Though the excised ganglion shows changes, yet the true relationship between it and glaucoma is an open question.
3. It is not the *sine qua non*, but a most valuable adjunctive procedure.
4. It is always indicated when an iridectomy or sclerotomy in any form of glaucoma has failed.
5. Iridectomy is still the classical treatment for certain forms of glaucoma, i. e., chronic and acute.
6. It is the preferable procedure in glaucoma absolutum and hemorrhagicum.
7. Operate only on one side—affected side.

8. Employ the suitable medicinal treatment after the operation.

9. Do not extirpate the ganglion in acute inflammatory forms of glaucoma.

10. There probably is a close connection between the ciliary ganglion, superior cervical sympathetic and glaucoma. What it is, experiments will show.

11. Extirpation of the ganglion is indicated whenever there is increased tension not controlled by any other measure.

12. The result depends in a great measure upon the condition of the case.

13. Primary extirpation may have to be followed by an iridectomy.

14. It is indicated in those cases of glaucoma which already have extremely poor vision and where any interference with the eye proper might result unfavorably.

15. It is to be considered at all times when other operative measures are refused, irrespective of the form of glaucoma.

16. The excision of this ganglion has varying effects upon the fundus oculi—none detrimental, however.

Blindness From Inhalation and Ingestion of Methyl Alcohol.

WÜRDEMANN, H. V., Milwaukee, Wis. (*American Medicine*, DEC. 21, 1901.) The writer gives the histories of several cases illustrating this form of blindness and concludes his paper with the following review:

"From the foregoing it seems that the ingestion of methyl alcohol by the mouth or inhalation of its vapor will produce blindness of a characteristic type, which is sudden and in most cases complete, which tends later to a partial or incomplete recovery. Without securing an authentic history and without observation for some weeks or from one examination of a case, it would not be possible to state that "a certain case of blindness was or was not caused by methyl alcohol," as the ocular appearance, the state of the vision and the scotoma in the visual field are the same as in the other forms of toxic amblyopias; but I should say that if in a certain case proof were given of the ingestion or the inhalation of methyl alcohol which was followed by vertigo, nausea, vomiting and mental disturbances with sudden blindness, and which upon examination showed

the objective appearances above stated, and which did not make a recovery as usually occurs with ordinary alcohol or tobacco poisoning, that the physician could be positive in stating that the cause of the blindness was due to the methyl alcohol."

Reflections on Ophthalmic Work in the Army.

GRIMSHAW, JOHN. *(British Medical Journal* (London), January 18.) After reviewing his experience with recruits, Grimshaw offers the following suggestions: "1. Do not admit more ametropes by still further lowering visual tests unless prepared to correct their vision. 2. The examination of such ametropes by ophthalmic experts (civilian or military) and their vision and correction to be recorded on their medical history sheets. Such action would be necessary not only to treat the 'scrimshanking and discharge' stages of soldier's *folie circulaire*, but to render easy the replacement of broken or lost glasses. 3. Opticians to be officially appointed whose duty it would be to keep an exact record of glasses supplied, to check the regimental data. 4. The distribution of recruits according to their sight to branches of service not necessitating keen vision or otherwise. If the visual tests were lowered, it would be of paramount importance to separate the 'hewers of wood and the drawers of water' from the soldier who proposes to become a good rifleman, cavalry man or artillerist. 5. To support discipline, and to lessen the responsibility of medical officers by inflicting summary punishment—by courtmarshal and under the certificate of the ophthalmic surgeon—on soldiers afflicted with *folie circulaire* of above type. 6. To encourage the correction of ametropia by granting spectacles to soldiers free of cost. I never could understand why free spectacles were given to South African individuals conditional on their discharge from the army. I should have thought that a non-discharge was a more rational condition. The War Office grants artificial teeth to the men who are likely to become efficient soldiers and who are willing to remain in the army. Why not spectacles? 7. Official encouragement to R. A. Medical Corps officers to especially qualify themselves in ophthalmic work, such special qualifications to be rewarded with corresponding increase of pay. 8. The appointment of civil consultants in certain military

centers or districts to cooperate with the R. A. M. C. officers as occasion demanded or rendered desirable. 9. Special arrangements to be made whereby spectacles lost or broken can be replaced, and for ensuring suitable glasses being always available on occasions of need. This applies specially to men abroad or on active service."—Abs. Jour. A. M. A.

Ocular Pain: Its Significance, Varieties and Treatment.

DUNN, PERCY. (*The Lancet*, January 18.) Ocular pain is an invaluable symptom, as Dunn points out, and its absence in inflammatory conditions of the eye may be, as a rule, considered as a favorable sign. Very little pain occurs in connection with conjunctival affections, but the cornea is especially sensitive and this symptom may be a very important guide in suggesting corneal disease where the lesion is minute. In all cases of doubt the corneal surface should be carefully inspected through a lens. Photophobia is explained as due to exposure by minute ulceration, etc., of the corneal plexus. Iritis is not always accompanied with pain and the amount of pain is not always an indication of the severity of the attack, but when the inflammation extends to and involves the ciliary body a distinct tenderness of the globe on palpation is present. In the different forms of iritis the pain symptoms vary. In syphilitic iritis it is very variable, but generally persistent. In rheumatic iritis it is usually present in marked degree, but chiefly in the night time. In syphilitic iritis the pain when once relieved does not recur and the most effective treatment in the acute case is local abstraction of blood by means of leeches on the temple of the affected side. In the rheumatic form the pain is of neuralgic character, differing from the throbbing inflammatory type in syphilis and its subsidance is generally the first indication that the attack is passing off. Dry heat is the best application in this class and nothing acts so well as the old fashioned bran poultice. Leeches are not necessary nor are sedative drugs. Pain in the atrophied globe implies the immediate necessity of enucleation whether there be danger of sympathetic ophthalmia or not. In glaucoma the pain is not due simply, he thinks, to stretching of the sclera, but he suggests that it is due to the compression to which the ciliary processes are subject during the attack, where the only treatment, of course, is iridectomy.—Abs. Jour. A. M. A.

ABSTRACTS FROM ENGLISH COLONIAL OPHTHALMIC LITERATURE,

BY

FRANK ALLPORT, M. D.,

CHICAGO, ILL.

(Quarter ending December 31, 1901.)

Syphilis as Seen by the Ophthalmic Surgeon.

BULLER, FRANK, M. D. *(Montreal Medical Journal.)* Primary syphilis is rarely seen by the ophthalmic surgeon; in the secondary stage, iritis is common; interstitial keratitis is frequently seen as a manifestation of hereditary syphilis; but the greatest number of cases are in connection with the tertiary period, and these too, in patients apparently cured for a long period and who have been under routine treatment for months and years. True interstitial keratitis sometimes occurs as a tertiary manifestation.

The iris is frequently affected. Simple plastic iritis occurs as an early secondary symptom; nodular iritis between the sixth and ninth month of the infection, and between the first and third years after primary infection a mild form of iritis with opacity of the vitreous.

Scleritis similar to rheumatic scleritis and a rare gummatous cyclitis are met with and are distinctly tertiary lesions.

A violent form of retinitis with much opacity of the vitreous and great decrease of vision and usually affecting both eyes, sometimes occurs as one of the earlier tertiary symptoms.

Optic neuritis is common as a tertiary lesion—then there are disturbances of motility due to a syphilis lesion occuring in the course of some of the oculo-motor-nerves.

From this large list of syphilitic ocular affections frequently occurring in patients who have with their physicians made every reasonable effort to get rid of the

disease, the author concludes that the present routine treatment is inadequate. The routine treatment referred to is protiodid of mercury in doses of gr. 1/6 to gr. 1/4 three to four times daily and at intervals potassium iodid in large doses.

The author believes that the most efficient method of treatment is the old fashioned blue ointment rubbed in morning and evening for one month with tonics and good food—then potassium iodid in increasing doses for two or three months, then the mixed treatment continued for a long time.

Some Ophthalmic Compiications of Plague.

MAYNARD, MAJOR F.P. *(Indian Medical Gazette.)* During the recent epidemic of plague in Platua, the author observed twelve cases in which there were ophthalmic complications. In all these the attacks were severe and the results met with were not the result of lagophthalums but rather of iritis and opacities of the media.

The ocular affections were chiefly a hazy or sloughing cornea, iritis in many forms, from a slight iritis to occlusio pupillae and prolapse, scleral staphyloma and ciliary projection.

A Case of Primary Neoplasm of the Optic Nerve Sheath--Removed by Krönlein's Operation with Preservation of Eye and Good Vision.

POCKLEY, F. ANTILL, M. B. *(Australasian Medical Gazette.)* The patient was a healthy lad of thirteen years; for the last six or eight months without apparent cause the left eye had been gradually becoming more prominent and lately the sight had become affected—there was no pain and no inflammation and on examination the left eye was found pushed forward 3/8 of an inch. There was free movement and diplopia; the tension was normal and the pupil was normal; V—5/12. On deep pressure with the finger tip in the lower outer legment of the orbit there was an indistinct feeling of resistance.

A diagnosis was made of "retro-ocular tumor situated within the muscle cone, probably attached to the optic nerve but not directly implicating it."

A Krönlein's operation was performed and a firm smooth tumor was found attached to the optic nerve along about

3/4 in. of its length. It was not necessary to divide the external rectus or any structure to reach it and it was easily stripped off from the nerve.

After the detached bone was pressed back into position and the skin wound sutured, the eye went back immediately. The movements were unrestricted and the vision was the same as before the operation. The tumor was found to be a round celled sarcoma completely encapsulated.

ABSTRACTS FROM RECENT ITALIAN OPHTHALMIC LITERATURE.

BY

CASEY A. WOOD, M. D.,

CHICAGO.

(Quarter Ending December 31, 1901.)

Experimental and Clinical Contributions to Our Knowledge of Sympathetic Ophthalmia.

GASPARRINI, E. (*Annali di Ottalmologia*, XXX, 4, p. 285.) In previous researches Gasparrini established the fact that inoculations of attenuated cultures of the diphtheria bacillus in one eye of the rabbit led to an inflammatory process in the other eye, very similar to sympathetic ophthalmia in man. Two recent clinical cases have further convinced him that the sympathetic affection is due to the action of toxins generated by the bacteria, rather than to the latter themselves. In one case of infectious ophthalmia with sympathetic symptoms in the other eye, he was able to cultivate the diphtheria bacillus from the eye first affected. It required enucleation, but the affection in the other eye persisted, rebellious to all measures until diphtheria antitoxin was administered, when it promptly healed. In the second case, the sympathetic nervous symptoms persisted after the operation on the eye first affected, and became more intense. He instituted vigorous treatment with the bromids, injected calomel into the temple and cured the patient in two months. This case he considers more demonstrative than any experimental tests. The left eye exhibited nervous symptoms involving, later, the other eye, but with no nutritional disturbances in the latter. There was no increase of albumin in the aqueous or infiltration of the eyeball either in the ciliary body or elsewhere. Vision remained intact even when the blepharospasm, acrimation, hyperemia of the conjunctiva, photopho-

bia and photopsia were most intense. In both these patients the toxicity of the urine was most marked at the time the ocular disturbances were at their maximum. As the eye improved, the toxicity of the urine diminished. In neuritis connected with renal and cardiac affections or idiopathic neuritis, with ocular complications, the toxicity of the urine diminished as the condition of the eyes grew worse, as seen in a number of cases lately, investigated by Orlandini and soon to be published. It is evident, therefore, that the mechanism of the neuritis is different in the two cases. In neuritis of cardiac or renal origin, the intoxication is general since the toxic products are retained from insufficient elimination, with the neuritis as a result. In sympathetic irritation of the eyes, the neuritis is due to local infection, from some microorganism which generates toxic products, and these toxins are duly eliminated by the kidneys. The amount eliminated is consequently larger when the pathologic condition of the eyes is most marked. Those toxins which reach the optic nerve induce inflammation in it, possibly also in the ciliary body. These facts indicate that sympathetic ophthalmia is not a general affection, but is localized in the eye, on account of a nervous irritation proceding from the one first affected. Experiments on rabbits have abundantly confirmed this assumption. They demonstrate first that general infection, induced by the diphtheria bacillus, does not localize in the eye, even when the eye is subjected to intense irritation from the Faradic current, either before, or immediately, or several hours after the inoculation. The experiments also show that the same effects are obtained whether the diphtheritic toxins or the bacteria themselves are used. If the toxins injected are powerful, general infection results. In order to determine the exact degree of toxicity required for the transmission of an inflammatory process from one eye to the other, with the characteristics which sympathetic ophthalmia presents clinically in man, other and more numerous researches are needed. The passage of a toxin along the subvaginal sheath of the optic nerve was shown to be possible by Selenkowsky who injected staphylococcus toxins into the sheath of one optic nerve. Gasparrini made his injections directly into the eyeball in order to approximate as closely as possible the conditions in which sympa-

thetic ophthalmia developes in man. His researches prove that Schirmer is too positive when he states that sympathetic neuritis is a bacterial, while pure papillo-retinitis is a toxic affection. In the rabbit tests described, there were microscopical signs of neuritis without the presence of bacteria, as toxins alone had been used in the experiments.

Adults Seeing for the First Time.

FERRI, L. (*Annali di Ottalmologia*, XXX, 4 p. 241.) Two lads, about 16 years of age, were operated on for congenital cataract. Vision equalled perception of light. The first patient had at one time been able to read ordinary print, but for two years had been quite blind. The other had never been able to see. The first patient had three maternal uncles with congenital cataract, three brothers with defective vision and two others educated in the blind asylum. His one sister has normal vision. The cataracts were hard and each was operated in turn by discission with two needles. The first was divided into three segments leaving sufficient space in the center for the patient to count fingers at once. The gradual increase of this space left the pupil almost free. The results were less satisfac-factory in the other eye; the segments retracted only enough to leave a slit in the center. Oscillating nystagmus which was present remained unchanged after the operation. OD. : V. = 1/8 with + 10 D. OS. : V. = 1/20 with + 10.

In the second patient the cataract was fluid and simple discission with one needle was followed by complete resorption of the fluid in five or six days. Notwithstanding this perfect technical result, the functional results were almost nil owing to the fact that the optic centers had never been exercised in this patient and so remained a tabula rosa. The functions of the retina had never been developed during the years most propitious for their exercise. Before the retina can properly functionate long and persevering exercises are necessary to conquer the torpor which the inertia of many years creates in a functioning organ. Still another factor cooperates to render vision difficult in adults seeing for the first time, i. e., the inferiority of the system of refraction and the consequent imperfection of the retinal images with which such a person has to com-

mence his first visual efforts. This is a great disadvantage for the adult seeing for the first time, with which those who were able to see more or less before the formation of cataract do not have to contend. Experience has shown that this condition can be improved in time, especially by the method followed so successfully by Trombetta. (See Annals of Ophthalmology, Oct. 1901.) The first and most essential part of his training consisted in securing the association of the habitual sensations of touch with the new visual sensations of the same objects, finally accomplishing the gradual substitution of the latter for the former. The length and the tediousness of the education processes necessary to attain positive results, demonstrate the fact that in these cases one has to contend not only with the total absence of any conception of visual forms, but also with the lack of intellectual development on the subject.

The practical conclusions to be drawn from these two cases are that considerable reserve is necessary in estimating the results of cataract operations in congenital cases if the complete blindness from the gradual ripening of the cataract had not been preceded by a period of appreciable functional development. In the second place, we may anticipate better results, the earlier the operation is done. This new form of education is beyond the sphere of ophthalmologic clinics and institutes, and should be taken up by the asylums and establishments for the education of the blind, now that Gayet in his Lyons clinic and Trombetta at Turin and Florence have opened the way and demonstrated its feasibility and usefulness.

Two Cases of Epibulbar Melanosarcoma.

DE BERARDINIS, D. (*Annali di Ottalmologia*, XXX, 4, p. 248.) The first patient was a robust peasant, 78 years of age, with normal vision until the last four or five years. About this time a small black spot was noticed by his friends in the outer segment of the bulbar conjunctiva, near the periphery of the cornea. It increased very slowly in size until within five months of the operation when it commenced to develop more rapidly, causing some inconvenience. It had attained the size of a large bean, 1.5 cm. in length, by 1 in width and 3 mm. in height, the longest

axis vertical. The surface was smooth and shiny. Two smaller black dots were also noticed in the vicinity. The ganglia in the region were not enlarged and no melanogen could be discovered in the urine. The pedunculated shape, the color, the soft consistency and the rapid development clearly classified it as a melanotic sarcoma, although the alveolar structure under the microscope suggested at first glance a carcinoma. It was removed along with the black points in the vicinity, the operative defect being treated by drawing up the conjunctiva and putting in sutures. The operation took place in June, 1898, and no indication of recurrence was noted at the patient's death, two years later from heart disease. The patient in the second case was a woman of about 50. A small black spot in the outer segment of the limbus corneae was noticed two years before. It gradually increased to the size of 3 mm. in length by 2 in width, and projected 1.5 mm. When extirpated it exhibited all the characteristics of a melanotic sarcoma. One of the tumors was a mixed form with predominance of cellular elements, while the other was of the round and spindle-celled variety. One had developed in the limbus from a pigmented nævus. The pigment in these cases was probably not of hematogenic origin, but was evidently local pigment from the nævus. In the first case the nucleus as well as the protoplasm, was pigmented. The results of surgical intervention in this case were extremely satisfactory, not only because of the absence of recurrence but also from the esthetic point of view.

Hemicrania and Paralysis of the Fourth Nerve.

Scremini. (*Archivio di Ottalmologia*, IX, 1-2, p. 75, 1901.) This communication describes a case of hemicrania and asthma occurring occasionally, in a patient 37 years of age. Her brother was an epileptic and exhibited transient disturbances of vision and superior hemianopsia.

The patient experienced her first attack of hemicrania at the age of 28. It was on the left side, predominated in the orbital and supraorbital regions and was accompanied by nausea and vomiting, the attack lasting about twelve days. From that time until two years ago, similar attacks recurred every month, coinciding with the menstrual periods. During 1898 and 1899, she did not suffer from hem-

icrania, but on January 9th of the current year she had another and similar attack on the right instead of the left side. February 11th, another attack occurred, commencing as usual with pain in the right half of the head and especially in the orbital and periorbital regions, with nausea and vomiting. The pain soon diminished but lingered for sixteen days. On the 28th of February the patient awoke free from pain but with diplopia. Dr. Demicheri, who saw her at that time, diagnosed the case as paralysis of the superior oblique. The diplopia disappeared after one month and the patient has been in the best of health since. The peculiar features of the case are the tardy appearance of the hemicrania at 28, the coexistence of hemicrania and asthma, and the paralysis of the fourth nerve in the last attack. Scremini emphasizes the rarity of this isolated paralysis of the fourth nerve, as he has been able to find but one similar case in literature. [The history of this case points to its being an example of Charcot's "*migraine ophthalmoplegique*" which, although rare, has frequently been described by authors since its true character was discovered many years ago. C. A. W.]

Influence of Temperature on the Formation of Visual Purple.

GATTI. A. (*Annali di Ottalmologia*, XXX, 5 and 6, p. 377.) The extensive experiments detailed in this communication were undertaken for the purpose of determining whether the production of the visual purple is directly influenced by physical chemical conditions of the environment. Kühne, Ewald, Langerdorff, Holmgren, Colasanti and others have established the fact that the production of visual purple is not subject to the influence of the nervous system. Gatti selected temperature as the environment which exerts the most intense and continuous influence on the entire class of cold-blooded animals. The question offers the greater interest as our knowledge of the modes of reproduction of the purple will probably serve to throw light on the biologic office of this substance, a problem which is still the object of so much discussion. The researches hitherto undertaken in regard to the influence of the temperature on the retina have always been on the insolated organ. None had been devoted to the study of the conditions in the intact living eye, with its anatomic

and physiologic relations undisturbed, until Gatti ventured on the task, with frogs for his subjects. He found a temperature of 20 C. (68 F.), the most favorable for the production of the visual purple. Temperature of 1 to 4 C. (34 to 39 F.), and at 35 to 40 C. (95 to 104 F.), the first constantly, the latter occasionally, diminished the production of this substance. When the purple has accumulated in the retina, neither high nor low temperatures have any action on it.

Flatow found in studying heart action in frogs, that a temperature of 31 and 32 C. (88 and 89.5 F.), still permits the functioning of the heart, the limit sometimes a little higher, sometimes a little lower, but Aristow states that the frog heart can tolerate even 40 C. (104 F.) for a brief time (about three minutes). The frequency of the pulsations increases with a certain regularity from zero to 32 C. (32 to 88 .5 F.). The most effected action occurs at 20 to 22 C. (68 F.), and from this optimum it gradually diminishes above and below this temperature. Schulz in his study of the material metabolism and the temperature of the body in amphibians discovered that at 1 C. the frog eliminates so little carbon dioxid that it is almost impossible to detect its presence, while at 33 C. (90 F.), the maximum of elimination occurs. In this same line of research Aubert noticed a progressive increase in the elimination from zero to 27 C. Harless has established that at a temperature of 34 to 37 C. (93 to 98.5 F.), the nerves become so profoundly altered that they are no longer capable of functioning. These conclusions are ratified by Gatti's researches, which also establish that the optimum for the most effective action of the heart corresponds with that observed for the most effectual production of the visual purple.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

BY

E. E. Blaauw, M. D.,

BUFFALO, N. Y.

ASSISTED BY

J. G. Huizinga, M. D.,

GRAND RAPIDS, MICH.

(Quarter ending December 31, 1901.)

TRANSACTIONS OF THE NINETEENTH MEETING OF THE NETHERLANDS OPHTHALMIC SOCIETY AT LEYDEN, JUNE 2, 1901. TWENTY-FIVE MEMBERS AND TWO GUESTS; PRESIDED BY PROF. KOSTER.

The Use of Electromagnets in Ophthalmology.

Prof. Koster related the following case: A blacksmith complained of having been injured in the left eye by a piece of steel. A small air bubble, 1 1/2 mm. in size was found in the superior part of the anterior chamber and a small incised wound on the lower lid. With the loupe a small wound, already healed, was found at the inferior border of the cornea corresponding with that in the lid. Also a somewhat dark-colored spot at the root of the iris concealed behind the scleral part of the limbus. No injury of the iris or lens could be detected nor any change in the fundus. The circular shaped pupil reacted normally and was of the same size as that of the right eye. V.=5/V. 1.5 D. hypermetropia. The anterior chamber was of normal depth and contained no blood. A provisional diagnosis of corpus alienum intra-oculare was made. Extraction with the Hirschberg magnet was unsuccessful, even though the point had been introduced into the anterior chamber

through a small wound in the cornea. A month after the injury V.— 6/VI and the eye was quiet. Two months after the injury the foreign body appeared as a glittering sliver of steel in the chorioid. Two weeks later a glittering yellow-gray, lance shaped spot appeared under the equator. Patient refused another attempt at extraction with the magnet. Four months after the injury enucleation was performed. A sliver of steel, 4 mm. long and 1 mm. wide, was found in the sclera at a distance of 1 cm. from the disc under the macula lutea.

K. compares the relative value of the Hirschberg and the Haab magnets and particularly mentions the small effect at a distance of the Hirschberg magnet, so that the foreign body must be touched, if it is to be extracted.

Discussion.

PROF. SNELLEN, JR., could get no result with the Hirschberg magnet, when he used a cell-battery, but was more successful, when he used an accumulator. Dr. De Haas always removes the foreign body with the forceps, if it is in sight. His results with the Hirschberg magnet were not so good. He did not trust the sideroscope. Only the day before he saw something glistening in the lens by the use of focal illumination which he considered a foreign body. The sideroscope showed no deviation and the use of Hirschberg's magnet gave negative results. After enucleation he found a piece of iron in the bulb, 15 mm. long, 1 mm. wide and 1/3 mm. thick. He also mentions having found at one time a small piece of a stone-kettle in a lens removed for traumatic cataract.

PROF. STRAUB had good results with the Asmus's siderscope. Edelmann's strong magnet (a weak Haab magnet) gave him good results except once, when the iron stuck into the side of the eye-ball. He found that extractions through the cornea were not followed by as favorable results, so far as the acuity of vision was concerned, as when the foreign body was extracted through an incision in the sclerotic opposite to the position of the foreign body.

Diagnosis of Color Blindness.

PROF. STRAUB is strongly in favor of the pencils of Adler in place of the Holmgren wool test. With the pencils the results can be fixed.

PROF. KOSTER asks the patient to write the name of the color of the pencil and thus fixes the mistakes, e. g., a green-blind will write the word green with a red pencil. Dr. Schoute mentions that patients often complain that the writing does not agree with the color of the point of the pencil. Prof. Straub agrees with Schoute. In these cases he marks the mistake with a certain letter, so as to remind him of the fact, as it is an advantage also to know about which the patient is in doubt.

The Cul-de-sac Trachoma.

PROF. STRAUB refers to the white longitudinal cicatrix, parallel with the margin of the upper lid in the cases of cured trachoma. This is also described by Arlt. He considers this cicatrix to represent the total conjunctiva tarsi. Through cicatricial contraction this would become smaller than the surface of the tarsus. On account of its attachment to the margin of the lid it would be drawn to the marginal edge of the tarsus, while at the same time the conjunctival fornix is drawn over the tarsus. The ocular surface of the tarsus is then covered first by the conjunctiva tarsi, changed into a longitudinal cicatrix and then by a part of the conjunctiva from the superior cul-de-sac which is drawn over the tarsus. To the question how can we know that this membrane is a part of the fornix and not from the tarsal conjunctiva, he answers: 1. Its physical appearance, its smooth surface and its bluish color are an indication in the most pronounced cases. 2. The mucous membrane above the cicatrix continues without change of physical properties in that of the decidely reduced cul-de-sac. 3. The mucous membrane covering the tarsus above the cicatrix is loosely connected witht he tarsus so that the normal appearing membrane can be moved over the cartilaginous layer beneath. S. found in three cases that 2/3 of the tarsus had been covered by such a loosely-connected mucous membrane. He considers that this moving prevents deformity of the tarsus and entropion. If his supposition is right it should limit as much as possible the operation for excision of the cul-de-sac, which should only be permitted, when the whole fornix is considered lost on account of the extension of the disease. On the other hand it favors excision of the tarsus as proposed by Kuhnt, as this operation removes the point of

support for the cicatrix of the conjunctiva tarsi so that it can no longer produce entropion.

Dr. Jitta said that the cicatrix is immovable, because the tarsus itself has been affected. The mobility of the conjunctiva on the tarsus can be explained by infiltration of the subconjunctival tissue, which loosens the connection between the conjunctiva and the tarsus. J. still practices excision of the fornix, and has seen no subsequent atrophy. He also excised a small piece of the tarsus a few times but found it difficult and too disagreeable for the patient and therefore discontinued it. S. answered that he only considered the theoretical questions and does not accept the responsibility for its practical application. He doubts whether the tarsus is chronically inflamed, as trachoma is a typical affection of the mucous membrane only.

Prof. Koster thinks that this movable mucous membrane could be differentiated microscopically, as the culde-sac contains glands of Krause and the conjunctiva palpebrarum does not.

Cataract Operations With and Without Iridectomy.

Prof. Straub advises as the result of his experience that it is not always safe to operate without iridectomy. The disadvantages connected with operating without iridectomy are (1) iris prolapse and the objection of the patient to undergoing a second operation. (2) Partial prolapse so that the periphery of the iris comes in contact with the cornea. The operator is ap tto postpone the necessary iridectomy until it is too late. S. had two such cases. In one the vision was permanently reduced on account of an opacity of the cornea due to performing the iridectomy too late. (3) A more severe complication is glaucoma. As the after treatment is longer and requires more thorough atropinization than in a case where iridectomy is performed, the dangers from glaucoma are greater.

Out of 77 cases he had glaucoma in 7, two healed with myotics, three were cured by means of iridectomy and two were lost. He believes that these two cases would not have been lost, if an iridectomy had been performed at the time of operation and atropin used as little as possible. Instead of atropin S. has lately used ephedrin or rather mydrin, as it is unnecesoary to have complete mydriasis continuously. It is sufficient to dilate the pupil a couple

times daily. If a decided mydriasis is desired, a combination of one drop of a ten per cent. solution of ephedrin muriate and one drop of a one-fourth per cent. solution of atropin sulphate is highly recommended. (4) Finally S. considers the very undesirable increased length of time required for the after treatment, if complications set in, and the increased difficulty of operating on an eye for secondary cataract, when there is no coloboma of the iris. The principal reasons for this are the increased expense, the additional loss of time and the nervous temperament almost invariably associated with an apparent (to the patient) failure. Operation with iridectomy is advised in all cases where any danger from this source is to be apprehended; for all patients over seventy years, where time is an important element and in very nervous persons. All the cases of iris prolapse that S. saw were among nervous persons, even if directly after the operation the pupil had been perfectly round. S. prefers a preliminary iridectomy in these cases. S. syringes out the lacrimal canal and the patients, who pass this ordeal without getting excited, are operated on without iridectomy.

Prof. Snellen, Jr., does not consider atropin the cause of glaucoma after cataract operation. Synechiae anterior are more dangerous than posterior, if no iritis is present. (Knapp does not agree with this). Syn. ant. cause glaucoma, which S. seldom sees. Vitreous humor in the anterior chamber can also cause glaucoma and this is more likely to occur with iridectomy than without it and therefore S. prefers the simple operation and prescribes a myotic until the anterior chamber has been restored after which he gives atropin. S. maintains that the best incision is a corneal section as near to the periphery as possible. He also found iris prolapse more common in nervous persons. It often appears with nervous vomiting after the operation. If no complications set in three weeks are required for the convalescence.

Dr. Bouvin reported two cases of glaucoma a considerable time after the operation with iridectomy and attributed it to particles of capsule in the cicatrix. The cornea was affected with keratitis striata, which was accompanied by great pain.

Prof. Koster operates with iridectomy, when the iris

is flabby, and the pupil wide. He reports only one case of prolapse.

Formerly Straub used to prescribe atropin before the operation, but now he uses ephedrin. Syn. ant. was not the cause of glaucoma with his cases. He does not make a peripheral corneal section, but at the junction of the cornea with the sclera. The convalescence after the simple operation is shorter, but if complications arise then it is much longer. He considers atropin not *the* cause, but *one* of the causes, perhaps psychical influences have more to do with it.

A Case of Cysticerous Intra-Ocularis.

Dr. G. J. Rochat described the first case of cysticercus intra-ocularis ever reported in the Netherlands. The patient came from South Africa and had noticed parts of the worm in the fecal matter. He underwent two separate courses of treatment, but unsuccessfully. After a few months he became subject to epileptic seizures accompanied by cramps in the arms and legs. The physician who treated him considered these to be due to specific origin. At the same time vision in the left eye began to fail. In January, 1900, he came to the clinic at Utrecht on the advice of his physician, who had told him, that he had detachment of the retina. V. O. S. 5/60. T = N. Field of vision contrated to an oblique elipse with its long axis from the sup. nasal to the inferior temporal quadrant. Media clear. In the superior temporal region of the retina was found a bubble-like tumor similar to "solutio retinae" with a few grey spots. Prof. Snellen, Sr., saw movements and a change of position downward after a few months. The eye remained quiet until March, 1901, when in a few days it became red and very painful. The eye was enucleated. Microscopically four different shaped cavities were found in the apparently normal appearing chorioid. In one cavity was a white body 3 mm. long and 1 mm. wide.

The microscope showed this to be a cysticercus. The wall was formed of connective tissue lined with a thick layer of polynuclear leucocytes at the place where it is united with the degenerated retina. The capsule does not contain any vessels. Many giant cells appear in the

capsule and its vicinity. The second cavity had the form of a half moon. The wall was similar to the above, but it was entirely empty. It is possible that the parasite had previously lived in it. A communication with the first cavity could, however, not be found. The other cavities belonged to a system of microscopic-sized ones, the result of a cystoid degeneration of the retina. The choroid and corpus ciliare were very hyperemic and infiltrated with leucocytes. The vitreous body is compressed within the small space between the lens and the anteriorly displaced retina.

Myopia in Diabetics.

Dr. Van Der Brugh says that the conclusion, that the refractive power of the eye increases with the amount of sugar in its contents, is wrong. That the refractive coefficient does not increase in this way. Increase of the index of refraction of the nucleus of the lens increases its refraction and increase of the index of refraction of the cortex decreases its refraction. Schrapinger is the only writer who mentions that lowering of the index of refraction of the vitreous increases the refraction of the eye. Increase of the indices of the fluid contents of the eye diminishes its refraction. Therefore an equal percentage of sugar in both humors of the eye cannot be the cause of diabetic myopia but would rather tend to hypermetropia.

Other causes must be searched for. Shortening of the corneal radii and increased length of the ocular axis have never been demonstrated in diabetics. Continuous spasm of the ciliary muscle cannot be present, especially in old persons. The cause must therefore be in the lens. Some investigators found sugar only in the cortex and this would increase the index of refraction of that part of the lens and therefore reduce its refraction and make the eye hypermetropic. The other change that takes place in the lens is a cataractous one. This cannot be explained by the presence of sugar in the humors as these contain only 0.5 per cent., and according to Deutschmann the lens of a cadaver will remain clear in 2 to 3 per cent. of sugar. If the myopia remains for a considerable time it must be explained by swelling of the lens increasing the curvature of its sur-

faces. Another explanation must be sought for those cases were the myopia appears intermittently, simultaneous with the appearance of the sugar in the urine. The amount of myopia is small. It is possible that in these cases the sugar is present only in the aqueous, or in larger quantities than in the lens or the vitreous.

PROF. SNELLEN, JR., asks whether measurements have been taken of the anterior surface of the lens to determine any increase of its curvature. Answer, no. Prof. Koster asks whether the writer had noticed any difference between the myopia due to diabetic and senile cataract. Answer, no. Dr. V. D. B. quotes Fuchs that in senile cataract the total index of the lens increases, but does not decrease. Prof. Koster again asks whether it would not be possible that the ciliary body had undergone such changes that irritation of the ciliary nerves and muscle might not cause an accommodative condition, that would have such results. The possibility of this is not denied by the writer.

Experience with the Removal of the Lacrimal Gland.

DR. D. J. BLOK performed this operation, curing the epiphora, but resulting in a very annoying conjunctivitis causing most trouble in the evening. A sticky, irritating fluid was secreted accompanied by photophobia. He asks whether the others have had similar experiences.

DR. STRUYCKEN reports that he has performed this operation 18 times and had a conjunctivitis in 3 of them, which was cured by treating the mucous membrane of the nose. Dr. B. reports that this had not been neglected in his cases and yet the conditions remain.

Demonstration of an Apparatus to Measure the Antero-Posterior Movements of the Eye.

DR. A. TUYL mentions the conditions that have to be fulfilled.

I. The eye must not be injured.

II. The physiological relations must not be disturbed.

III. The small displacements must be considerably enlarged and registered on a chart. This can be done by means of a lever, the small arm of which presses against the anterior surface of the eye, while the long arm registers the movements accurately. A description of the instrument follows.

Trachoma in the Schools of Amsterdam.

Dr. N. M. Josephus Jitta reports the results of examining 12 public schools principally attended by Jewish children and one private school, a total of 4250 pupils. Comparing the statistics of 1880 and 1897 there appears a large decrease in the percentage of trachoma sufferers. In 1880 it was 35.5 per cent., in 1897, 15.6 per cent., and now it is only 7.8 per cent. The older the scholar the higher the percentage, as is shown by the fact that in the first class the percentage was only 5 per cent. and in the sixth class it was 10 per cent. The writer explained this by saying that the percentage of trachoma in young children (from 3 to 5 years) is gradually decreasing as compared with former years.

Prof. Straub maintains that infection does not occur in school nor by attending school, but before the children come to school.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

BY

J. GUTTMANN, M. D.

NEW YORK.

(Quarter ending December 31, 1901.)

Operation for Juvenile Cataract.

BLASKOVICS, DR. FR. (*Pester Med. Chirurg. Presse*, July 21, 1901.) Between January 1, 1801 and December 30, 1900, there were performed at the eye clinic of the Pester University 527 operations for juvenile cataract and 36 for myopia. Three modes of operation were used in these 527 cases: (1) Discission of the lens capsule, (2) Simple linear extraction, and (3) Extraction combined with iridectomy. Discission of the lens capsule was done in 90 cases for cataract and in 20 for myopia. Simple linear extraction of the lens was performed in 237 cases for cataract and 12 cases for myopia. Extraction of the lens combined with iridectomy was done in 200 cases of cataract and 4 cases of myopia. In 149 of these cases both of the operations were performed at the same sitting, whereas in 51 cases the iridectomy preceded the extraction.

The technique of discission of the lens capsule was as follows: By means of a Roosa's stop needle the cornea was entered in its outer and lower quadrant just over the edge of the artificially dilated pupil and then two long, but superficial incisions were made in the capsule, crucial in shape.

In case of much swelling of the lens, the possibility of a glaucomatous attack was anticipated by puncture of the upper part of the cornea opposite the margin of the artificially dilated pupil.

The length of this incision was 3-4 mm. and the lens was then removed by means of a Daviel spoon but never forcibly.

Of the 90 discissions thus performed for soft cataract 83 were without complications and 7 with complications, all occurring in persons below the age of 25 years. In 74 of the first set of cases (i. e., 89 per cent.) puncture of the cornea was necessary and in 3 of the cases (3.6 per cent.) some vitreous humor escaped. In 2 cases (2.4 per cent.) the operative wound became infected, but cauterization soon controlled this infection. In 3 cases a mild iritis followed and in 3 other cases (3.6 per cent.) a rather protracted form of iridocyclitis which, however, was not purulent. Inflammation which finally developed into panophthalmitis was noted in 4 cases (4.8 per cent.).

Incarceration of the iris and of the lens capsule existed in 9 cases (10.8 per cent.). The power of vision was diminished in 36 cases (43.4 per cent.).

Discission was performed in only 7 cases of cataract where complications existed. These complications consisted of adherent cicatrix, posterior synechiae, iridocyclitis, failing sensitiveness to light and nystagmus. In 2 cases there was luxation of the lens. Puncture of the cornea was performed in 5 of these cases. No complications developed after the operation. An appreciable part of the lens was left behind in 4 cases.

Discission was employed for myopia in 20 cases. In all of these cases puncture of the cornea was done 4-6 days after the operation and in 3 of the cases it was punctured twice.

During the operation vitreous humor escaped in one case. Before the puncture a second discission was necessary in 4 cases and a third discission in 3 cases.

Moderate cauterization was necessary in one case of infection of the wound. Mild iritis followed in 2 cases.

Iridocyclitis was followed by atrophy of the bulb in one case.

Five patients were discharged with remnants of the lens still left behind. In 2 cases incarceration of the lens and in one case incarceration of the iris developed. Secondary cataract necessitated another operation in 11 cases.

In 5 of these cases discission and in 5 cases simple extraction of the lens and in one case extraction plus iridectomy was performed.

Among the 121 uncomplicated soft cataracts prolapse of vitreous occured in 10 cases (8.3 per cent.). Incarceration

of the iris and the capsule of lens in 18 cases (14.9 per cent.).

Infiltration of the wound and a mild iritis was present in 5 cases (4.1 per cent.). Iridocyclitis in 2 cases (1.6 per cent.). Panophthalmitis in 3 cases (2.5 per cent.); 26 patients (21.5 per cent.) were discharged with particles of the lens left behind and deminished power of vision.

The results were not so favorable in the 41 cases of membranous or shrunken cataracts. In 5 cases (12.2 per-cent.) there was a prolapse of vitreous. Post operative incarceration of the iris and panopthalmitis occurred in 2 cases (4.9 per cent.) In 3 cases (7.3 per cent.) a mild iritis and in 4 cases (9.7 per cent.) iridocyclitis and remnants of the lens occurred.

Of the 54 cases of complicated soft cataracts the complications consisted of 2 cases of adherent cicatrix, 10 cases of posterior synechiae, one of chronic iridocyclitis and 9 cases of foreign body in the lens, 4 cases of dislocation of the lens. In 3 cases there was lack of sensibility to light and in 24 cases maculae of the cornea, nystagmus, strabismus, microphthalmus and atrophy of the chorioid. Vitreous humor escaped during the operation in 9 of the cases.

After the operation there were noted five cases of incarceration of the iris and one of mild iritis.

In 8 cases (14.8 per cent.) vision was diminished through remnants of the lens. We may consider as unfavorable results 2 cases (3.7 per cent.) of iridocyclitis which finally ended in atrophy of the bulb.

In the 21 cases of complicated membranous cataract the complications consisted of 3 cases of adherent cicatrix, 7 cases of posterior synechiae. In one case there was a hyalitis and absence of sensibility to light, and in 9 cases amblyopia. In 3 cases quite an amount of vitreous escaped during the operation. In one case there was noted incarceration of the iris, mild iritis, and remnants of the lens left behind.

A remarkably good result was obtained in the cases of traumatic edematous cataracts which were removed by means of puncture of the cornea. Infection of the wound was not seen in these cases. Among the 47 cases of traumatic cataract there were in 9 cases other complications besides the wound of the cornea, viz.: in 3 cases

there was prolaps of the iris together with severe iridocyclitis, and in one case there were posterior synechiae, absolute glaucoma and corneal maculae. In 2 cases (4.2 per cent.) vitreous escaped during the operation. After the operation there developed incarceration of the iris in 2 cases (4.2 per cent.), mild iritis in 4 cases (8.4 percent), iridocyclitis in 3 cases (6.4 per cent.), and remnants of the lens in 26 cases (55.3 per cent.).

Simple extraction of the lens was performed in 12 cases of very marked myopia. After the operation there followed, in one case incarceration of the iris, and in 2 cases iridocyclitis. Four patients were discharged with remnants of the lens still present, which affected their visual powers markedly.

Five of the patients came back for a secondary operation, and in these discission was performed in two cases and simple linear extraction in 3 cases.

In the above statistics of the iridectomy with linear extraction, the writer included also those cases in which a preparatory iridectomy had been previously performed.

These were only few in number and the results in them did not differ materially from the cases where the excision of the iris and the lens were done at the same sitting.

Forty-eight cases of soft cataract were operated in this manner and in only 2 of these was iridectomy performed first. In only 1 case (2.1 per cent.) did vitreous escape during the the operatien. Incarceration of the lens capsule and gaping of the wound was noted in one case (2.1 per cent.). Remnants of the lens were noted in 10 patients (20.8 per cent.) at the time of their dismissal.

Thirty-seven membranous cataracts were removed by means of iridectomy, in 29 of these cases however the iridectomy was done previously. Vitreous escaped in 6 cases (16.2 per cent.). In 2 cases (5.4 per cent.) mild iritis followed and in one case (2.7 per cent.) particles of lens were left behind.

Of the complicated cataracts 82 were of the soft variety and in 7 of these iridectomy had been previously performed as a preventive measure.

Before the operation the following complications were noted—adherent cicatrix in 33 cases, posterior synechia in 17 cases, chronic iridocyclitis in 5 cases, foreign bodies in

5 cases, dislocated cataracts in 3 cases, lessened sensibility to light in 3 cases, and lastly 12 cases there were maculae of the cornea, nystagmus, neglected strabismus and microphthalmus.

During the operation some vitreous prolapsed in 7 cases (8.5 per cent.). After the operation there developed in 2 cases (2.4 per cent.) a mild iritis and iridocyclitis. In one case (1.2 per cent.) there was gaping of the wound and in 5 cases particles of lens remained.

Of the 33 cases of membranous and shrunken cataract iridectomy as a preventive measure preceded the extraction in 13 cases, and in 20 cases it was done in one sitting with the extraction. The following complications were noted in these cases—adherent cicatrix in 6 cases, posterior synechiae in 11 cases, siderosis bulbi and insufficient sensitiveness to light in one case, and in 4 cases there were maculae corneae, amblyopia, etc.

Vitreous escaped during the operation in 4 cases (12.1 per cent.) mild iritis followed the operation in one case (3 per cent.), iridocyclitis in 2 cases (6.1 per cent.), gaping of the wound in one case (1 per cent.) and remnants of lens in 2 cases (6.1 per cent.).

Iridectomy combined with linear extraction was undertaken in 4 cases of myopia. Mild iritis followed the operation in one of these cases and left a few permanent adhesions posteriorly.

Extraction of the secondary cataract caused a recurrence of the iritis which necessitated a third iridectomy. In the other three cases there is as yet no indication for secondary operation.

The writer then makes the following deductions as to the value of the various methods of operation. He states that infection of the wound followed in 2.4 per cent. after discission. On the other hand the percentage of infection in the 237 cases of linear extraction was 5.5 per cent. This percentage is higher than that of discission (2.4 per cent.), but we can ascribe this to the greater length of the wound. The fact that infection never followed discission for complicated cataract, or simple extraction for membranous cataract he thinks is a mere accident.

The mild iritis following the operations he thinks is scarcely important enough for consideration, as it is

due only partially or perhaps not all to infection. As regards the iritis there is hardly any difference in the various methods of operation.

After extraction for membranous cataract the percentage of iritis was somewhat greater (7.3 per cent. and 5.4 per cent.) than that following extraction of soft cataract (4.1 per cent. and 0 per cent.). The writer thinks that this greater percentage is due to the increased trauma sustained by the first method.

Iridocyclitis of the severer type he considers as infectious in origin. It was seen in 3.6 per cent. after discission for uncomplicated cataract and in 3.7 per cent. after simple linear extraction, but it was not seen in one single case of the 85 where the extraction was combined with iridectomy.

The results are not so favorable in complicated cataracts. This, however, can be ascribed only partially to infection, for it has often been noted that the trauma incurred during the operation was sufficient to renew a latent uveal inflammation. Iridocyclitis did not follow even once in 7 discisions for complicated cataract. On the other hand it did develop in 6.7 per cent. of the 75 simple linear extractions and in 3.5 per cent. of the 115 cases of iridectomy.

Infection which finally ended in panophthalmitis was seen in 4.8 per cent. of cases of discission for soft, uncomplicated cataract, in 2.5 per cent of cases of simple linear extraction and in 4 per cent. of cases of simple extraction of membranous cataract.

Of the 200 cases of extraction with iridectomy not one resulted in panophthalmitis.

These data show conclusively that from the standpoint of infection the cases operated by means of discission show the least favorable results; the cataracts operated by simple linear extraction show better results, whereas the results of extraction of the cataract combined with iridectomy are by far the best. We have also seen that the last named method gave getter results in membranous cataracts than in those of the soft variety.

Particles of the lens were found most frequently after discission (48.9 per cent.), less frequently (13.1 per cent.)

after linear extraction and still less (9 per cent.) after linear extraction combined with iridectomy.

Total loss of the eye occurred in 4.8 per cent. cases of discission for non-complicated cataract; in 2.5 per cent. of simple extraction for soft non-complicated cataract and 4.9 per cent. for membranous cataract and lastly in 3.7 per cent. of simple extraction for complicated soft cataracts. In contrast with these figures we note that not one single eye was lost in 200 cases of linear extraction when combined with iridectomy.

We must also state that no eyes were lost after discission for complicated cataract and after simple extraction for complicated membranous cataract. If we now look over the statistics of the complicated and not complicated cataracts we note that loss of the eye after discission was 4.4 per cent., after simple linear extraction 2.9 per cent., after extraction combined with iridectomy 0 per cent.

It is quite interesting to note how high the number of losses is in discission and that all these losses are caused by panophthalmitis. The fact that infections which are complicated with injuries of the lens cause very severe inflammations coincides with the experiments of Audagsky and Oswalt, who showed that the swollen particles of the lens are a very favorable medium for bacteria. The first author found that the infection is not as easily produced by extraction and that the inflammation is of a milder type than after discission because fewer remnants of the lens are left. In case the posterior capsule is also injured the infectious inflammation is of severer character even after extraction. This experience corresponds with the fact that at the eye clinic fewer cases of panophthalmitis occurred after linear extraction than after discission, and that after extraction of membranous cataracts, where the hyaloidea is almost always injured, infectious inflammation occurred in far greater number than after the operation for soft cataracts where the hyaloidea is rarely injured.

These facts were corroborated also by the cases of secondary cataracts operated by discission in which operation there were no remnants of lens left behind. It was shown that at the 248 cases of discission panophthalmitis occurred only in one case (0.4 per cent,) where as slight infection

of the wound occurred in 2 cases (0.8 per cent.), iritis in 6 cases (2.4 per cent.) and iridocyclitis in 4 cases (1.6 per cent.). These last cases took a mild course, so that really only 1 case (0.4 per cent.) could be recorded as lost.

The above mentioned experiments do not explain the differences in the results of the extractions operated with and without iridectomy, but clinical observation shows the difference very obviously, whether the rarer or milder course of infection after extraction combined with iridectomy is to be ascribed to the more complete evacuation of the remnants of the lens particles, or to the removal of pressure and infection of one part of the iris, or the (Worbeugen) removal of iris prolapse, is hard to say. But there can be no doubt that the cataract extraction combined with iridectomy is almost without any danger, as is shown that among the 200 juvenile cataracts—some of them with severe complications—not one single eye was lost, whereas the cases operated on at the same clinic under the same circumstances by the simple linear extraction showed a loss of 2.9 per cent.

In judging the value of a mode of cataract operation it is very important to consider the dangers of the following complications, the number of incarcerations of iris and lens capsule and of cloudiness of the vitreous. The author found incarceration of the iris after discission in 10 per cent., after simple linear extraction in 10.9 per cent., after linear extraction combined iridectomy only in 0.5 per cent. In regard to the prolapse of vitreous the results were better after discission, and prolapse of vitreous following discission occurred only in 3.3 per cent. of cases.

After simple linear extraction in soft cataracts there was prolapse of the vitreous in 10.8 per cent., in membranous cataracts in 12.9 per cent. After extraction with iridectomy of soft cataracts there was prolapse of vitreous in 6.1 per cent., in membranous cataracts in 14 per cent. of the cases.

We may now conclude from the various data that there is no doubt, that extraction combined with iridectomy is to be preferred to discission and to simple extraction.

In regard to high degrees of myopia, there is no reason to select a different mode of operation from that followed in juvenile cataracts, i. e., extraction combined with iri-

dectomy. Hirschberg also neglects discission as he considers it a non-surgical procedure.

Indications for Operation on Senile Cataract.

BONDI, MAXIMILIAN, M. D. (*Wiener Medicinische Presse*, July 28, 1901.) In every case of senile cataract there are two questions to be decided (answered).

1. Is the cataract a simple uncomplicated one, i. e., after the removal of the opaque lens will the eye, which was blind till the present, regain the power of vision?

2. Has the time already come for the operation, i. e., is the cataract ripe for operation?

Regarding the first question, we speak of a simple uncomplicated cataract as one where the affected eye with absolutely opaque lens is able to recognize and properly to localize the light of a candle in a dark room at the distance of 6 meters. Besides this it is necessary there should be no infection of the conjunctiva and of the lacrimal duct, and no affection of the cornea and iris. Examination of the interior of the second eye he considers as a very important point. As regards the second question, most of the handbooks consider the cataract ripe or unripe according to its anatomical condition. The author considers a cataract ripe for operation only then, when the power of vision in both eyes is diminished to that extent that the patient can no longer continue his regular occupation.

He therefore does not consider a one-sided cataract, though it be anatomically ripe, as fit for operation so long as the other eye possesses good vision. He gives the following reason for this assertion. The eye with aphakia (without a lens) has no power of fixation in central vision, and we must therefore place a strong convex lens in front of this eye and a plain glass in front of the other eye. Such a difference between the two glasses the patient could not stand, and he would in that case use only the good eye anyhow. Concerning the enlargement of the field of vision, this in most cases is not of much practical value.

In cases where the other eye is also affected with incipient cataract, the power of vision of the good eye is to be considered in performing an operation on the eye with an anatomically ripe cataract. Only when the power of

vision of the good eye is diminished to less than 1/3 should the cataract of the other eye be considered as operable.

On the other hand, if the power of vision of the good eye has decreased to 1/3, he operates the other eye even though the cataract be not absolutely opaque or anatomically ripe.

In concluding about the ripeness of a cataract the writer states:

1. An anatomically ripe cataract should not be operated upon as long as the other eye possesses normal or nearly normal powers of vision.
2. A cataract is to be considered as ripe for operation only when the power of vision of the good eye has decreased to less than 1/3.
3. It is not absolutely necessary that the lens be absolutely opaque to be considered as ripe for operation.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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ASSISTED BY

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(Quarter Ending December 31, 1901.)

A Special Eyeglass Intended for Eyes that Have Been Deprived of the Iris.

KOENIGSHOEFER, Stuttgart. (*La Clinique Ophtalmologique*, 10th October, 1901.) Königshöfer describes a special eyeglass fitted with an iris diaphragm by means of which the amount of light entering the eyes may be controlled, thus avoiding the difficulties that are incident to sudden changes in the amount of illumination.

Dacrioadenitis with the Formation of a Periglandular Abscess.

MAKLAKOW, Moscow. (*La Clinique Ophtalmologique*, 10th October, 1901.) Maklakow reviews the literature of this subject, and finds but fifty-eight described cases. He reports the instance of a twenty-three year old female who had scrofula when a child and whose brother and sister died of tuberculosis. Three weeks before he saw her she noticed that a painful mass began to appear at the outer angle of the right orbit. Examination showed a dense immobile tumor of about the size of a walnut situated at the upper outer angle which displaced the eyeball and upper lid downward. To the inner side of the mass there was an area of slight fluctuation which, on incision and sounding, revealed the presence of subcutaneous infiltration of pus.

The author concluded his case to have been one of chronic adeno-cystitis in which periglandular infiltration had passed on to the formation of pus; the glandular structures being protected from involvement by the bactericidal action of the lacrimal secretions.

A Loupe for Workers, Such as Clock Makers and Jewelers Who Wear Glasses.

KOENIGSHOEFER, Stuttgart. *(La Clinique Ophtalmologique*, 10th October, 1901.) The loupe devised by Königshöfer corresponds in size with the lens that is worn and is joined to the frame at its outer angle by means of a special joint so that when not in use it can be swung out of the range of vision.

Tumors of the Lacrimal Glands.

FROMAGET, Bordeaux. *(Archives d'Ophtalmologie*, November, 1901.) Fromaget places three cases of tumors of the lacrimal glands on record.

The first was that of a twenty-four year old man who had a firm growth resembling a large chalazion situated in the upper outer part of the orbit. There was not any other disturbance except a slight conjunctivitis. The mass was easily removed through an incision of three centimeters' length made beneath the brow. Convalescence was rapid and the cure was permanent. Histological examination revealed that the mass was of mesodermic origin (a sarco-myxo-fibroma); that is, it was a cellular tumor of sarcoma type in which mycoid degeneration and fibroid changes had developed.

The second case was that of a fifty-six year old man who came complaining of orbital and temporal neuralgias with an increasing prominence of the left eye of six months' duration. There was slight ptosis and a marked exophthalmos. Occupying the lacrimal fossa, could be felt a dense round immovable mass which had not any connection with the globe or the upper lid. Under chloroform anesthesia, a canthotomy was done and the tumor was easily enucleated through a conjunctival incision made while the lid was everted. Convalescence was uneventful.

Microscopic examination revealed the presence of a tubular epithelioma springing from the lining of the glandular acini.

The third case occured in a sixty-five year old patient.

There was the history of an increasing exophthalmos of six months' duration. During a period of thirty days before he was seen, there were violent orbital pains with rapidly failing vision.

Ptosis, marked exophthalmos with depression of the globe downward and outward; moderate chemosis; and trophic changes in the cornea were all present.

Situated in the orbital fossa there was a rounded fluctuating and non-reducible tumor which was somewhat tender. Under chloroform narcosis a bilocular tumor was removed through an incision in the brow. During its removal the mass ruptured allowing the escape of a sangineous and a clear watery fluid from the two loculi.

Histological examination of the growth rendered the diagnosis of hydatid cyst certain.

Convalescence was rapid; the exophthalmos and the muscular and trophic disturbance almost disappearing.

In conclusion, the author states that radical operation should be advised and is preforable except in cases of poorly defined malignant tumors in which canthotomy and conjunctival incisions accomplished by the cutaneous route are to preferred.

Angiofibroma of the Orbit. A Modification of Kroenlein's Method.

PARINAUD and ROCHE. (*Annales d'Oculistique*, October, 1901.) The case reported by these two authors is cited on account of its slow development, the benignity of the symptoms, the histological character of the growth, and the method of operative procedure employed. The patient, a woman of twenty-eight years of age, presented herself in 1894 with a marked exophthalmos on the left side. The family and venereal histories were negative. For two years' time before being seen, the eye had become increasingly more protuberant than its fellow. There had been an intermittent diplopia. Vision had not markedly failed.

Examination showed a marked left exophthalmos. Both pupils were equal in size and the irides were active. The orbital walls were normal. There was not any limitation of ocular motion. No diplopia could be gotten. Palpation and auscultation of the orbit were negative. The ophthalmoscope showed a moderate degree of optic neuritis. Cor-

rected vision was reduced to one-fifth of normal; that of the right eye being undisturbed. The visual fields were intact.

In three years' time the exophthalmos had much increased, a hypermetropia of three diopters had doubled, and vision had fallen to one-sixth of normal. At this time a dense round tumor, not exhibiting any bruit or thrill, was palpable in the upper outer portion of the left orbit. Four years after this the hypermetropia had risen to nine diopters and vision had fallen to one-seventh of normal. Examination of the fundus showed that the optic disc was pallid, this being associated with a slight venous stasis. The tumor was visible through the eyelid, though except for its size it remained unchanged.

After criticising Kroenlein's operation in which a vertical incision of six to seven centimeters in length is made just without the external canthus and by which a permanent scar and some distortion of the lids results, and Jonnesco's procedure in which horizontal incisions are added to the incision of Kroenlein, the author gives the method that was followed in the above case.

After the usual preparation, a vertical incision of some four to five centimeters in length was made in the scalp region at a position five centimeters' distance back of the orbital border. From the upper end of the incision forward to the supero-external angle of the orbit, and as far up as the brow, another cut was extended; with a third from the same extremity to the infero-external orbital angle parallel with the zygomatic arch.

The cutaneous flap thus formed, was dissected free, the superficial temporal fascia was divided, and the periosteum was incised along the edge of the malar bone and separated from the outer wall of the orbit. With the aid of a pair of flat scissors, horizontal incisions were made in the bone at the fronto-malar junction and at the head of the zygomatic process. The bony fragment that remained attached to the temporal muscle which had been incised along the lines of the osseous incisions, was next turned backward. Those procedures accomplished, the orbit was easily entered. The tumor was found to be independent of the optic nerve and had a small pedicle. It was removed. Hemorrhage was controlled, the parts were readjusted, the skin was sutured,

and an aseptic gauze dressing was applied. Convalescence was uneventful.

After the operation it was found that a slight diplopia which could be obtained upon extreme outward rotation remained. The hypermetropia had disappeared and visual acuity arose to one-fifth of normal. Scarring was very slight and there was not any distortion of the lids.

The tumor was three and a half by three centimeters in size and on section resembled splenic tissue. Microscopically, it proved to be a fibro-angioma with a much larger accumulation of fibrous tissue than is usual in cavernous angiomas. In conclusion, the author emphasizes the following advantages in his modification of the procedure: 1, more room; 2, absence of danger of infection due to the distance of the wound from the angle of the eyelids; and 3, no scarring or distortion of the eyelids.

The Extraocular Complications of Sympathetic Ophthalmitis.

De Wecker, Paris. (*Annales d'Oculistique*, October, 1901.) De Wecker disputes the position taken by Schirmer in a recent monograph "that sympathetic ophthalmia is not complicated in general with morbid processes elsewhere", and cites four cases:

I. (Reported by Rogman.) The patient, a fifty-nine year old man with a negative family and personal history relative to nervous trouble was operated on by the combined method for cataract in the left eye. Irido-chorioiditis resulted, followed four weeks later by the development of sympathetic ophthalmitis. Within three months' time both eyes became completely atrophied with the almost sudden development of complete deafness without any apoplectiform symptoms.

II. (Reported by the author.) In December, 1890, a forty-seven year old man was struck on the left eye by a chip of stone producing open wounds in the cornea and iris in their outer halves. This was followed by violent pain in the eye which lasted four days and then subsided, leaving a vision of light-perception only in the outer field.

Little more than a year later, severe pain developed in and beneath the injured eye, this being accompanied with general pyrexia. In forty-eight hours' time, pain with failing vision followed by blindness in three days' time, appeared in the fellow eye. Two weeks after this, hear-

ing became hyperacute, but the organ was not painful.

On January thirty-first, however, the patient became very sensitive to sharp sounds. A fortnight later hearing on the left side was negative: With this, there was a tinnitus as if steam were escaping. Some months after this, the left eye became soft and the cornea was almost opaque. Vision was reduced to an area of light-perception situated in the outer quadrant of the field. The right cornea was hazy with whitish deposits on its posterior surface. The pupil was contracted and nearly obliterated, and the iris was thickened, discolored, and filled with plastic deposits. Vision equalled faint light-perception.

There was photophobia. Enucleation of the left eye was performed and for a period of fifteen days the right eye was more painful.

Two months later, the left optic nerve was resected and a subconjunctival injection of a one to one-thousand strength solution of corrosive sublimate was made into the depths of the corresponding orbit. After the third injection, six days later, severe local pain and edema of the orbital tissues and eyelids with a temperature of 104° F. appeared. By the use of mercurial inunctions and the employment of hypodermatic injections of pilocarpine, these symptoms subsided with some improvement in the condition of the right eye. Slight but temporary betterment of hearing with the left ear appeared two months after this. Discouraged, the patient sought treatment elsewhere and died in eighteen months' time.

III. (Reported by Snellen.) A twenty-seven year old man presented himself with a purulent infiltration of the cornea and the crystalline lens some three weeks after an injury to the eye. One month later the cornea was incised and the lens was delivered on account of an increased intraocular tension and pain. Two days after this, an intense sympathetic cyclitis associated with delirium, violent pain in the head, and deafness, appeared. Forty-eight hours later, the injured eye was removed. The cerebral functions slowly returned, but blindness and deafness permanently remained.

IV. (By Garrigan.) This was a case of deafness supervening rapidly after an injury to the eye by a birdshot.

Aural examination was negative. The author believed

the deafness was the result of a migration of micro-organisms along the optic nerves to the auditory nerves producing changes in the middle ear similar with those that had been produced in the eye.

The author says that a parenchymatous keratitis is the only other ocular affliction that is associated with loss of hearing, and in this condition the evolution of the symptoms is different from what is found accompanying sympathetic ophthalmitis. He believes that the condition does not appear at the beginning of an attack of inflammation of the cornea nor when one eye only is affected Deafness he says, does not supervene if there are not any symptoms of irido-chorioiditis. He believes that deafness attacks both sides with equal intensity irrespective of the eye that is the first attacked. The deafness, he says, appears to accentuate as the eyes improve rather than during the period of full development of the ocular trouble. The deafness is never complete, nor is the ocular defect more marked when deafness has occurred. In cases that are complicated with deafness, vision suffers less severely than hearing. The author believes some relation exists between the deafness accompanying parenchymatous keratitis, and that following sympathetic ophthalmitis. He hopes that a study of these cases will help elucidate the problem of the transmission of ocular diseases from one eye to the other.

Suppurative Palpebral Dacrioadenitis.

Lor, Brussels. (*Annales d'Oculistique*, October, 1901.) Lor reviews briefly the scant literature on this subject and reports five cases.

In regard to etiology, he says that age and sex are important. The question of the side that is affected is only of diagnostic value, since changes in the orbital lacrimal glands are nearly always bilateral in character. In one case there was a possible local cause in a chronic blepharitis. He believes that Galezowski's opinion that dacrioadenitis manifests itself epidemically is not supported. Bacteriologic examination in three of his cases demonstrated the presence of the staphylococcus aureus.

He states that the pathogenesis probably consists in in a local process; an ascending infection similar with that producing styes and Meibomian abscesses.

The condition when fully developed, appears as in an inflammatory tumor that is more or less dense and painful. The mass is generally the size of a small bean and is situated entirely in the outer part of the upper lid, encroaching at times upon the palpebral commissures. The partial chemosis which is limited to the external palpebro-bulbar region, soon exhibits a yellowish point with a consecutive purulent fistula. As negative signs he has found that there is an absence of conjunctival secretion, and there is not any serious local or general reaction. He calls attention to the frequent and to the more or less painful swelling of the corresponding preauricular gland. The process, he says, may affect the orbital portion of the gland with a marked exaggeration in the local symptoms and a limitation of ocular movements. He finds that the condition lasts for a period of from seven to fifteen days. The abscess usually opens on the conjunctival surface at the point of least resistance. Prognosis is always good, differing markedly from that of primary suppurative orbital dacrioadenitis which may even prove fatal. Dacryops, he thinks, is an entirely theoretical sequel.

The diagnosis is comparatively easy. Acute purulent ophthalmitis, orbital periostitis, Meibomian abscess, and chalazion are all easily excluded. Abscess of the superior outer cul-de-sac of the conjunctiva closely resembles the condition: It would however lack the pyochemosis that it is so characteristic of abscess of the gland of Rosenmüller. Abscess of the orbital portion of the gland, he says, is attended by more marked local and general symptoms with pronounced disturbances of motion and alterations in the position of the eyeball.

Treatment consists in moist dressings and boric acid irrigations. Surgical intervention (incision or excision) is condemned.

Some Ocular Changes Consecutive to Neuralgias of the Fifth Pair.

KALT, Paris. (*Annales d'Oculistique*, October, 1901.) Kalt says that in 1822 Magendie determined that intracranial section of the trifacial nerve resulted in purulent destruction of the cornea. Later, Bernard showed that lesions of the ganglion of Gasser were almost constantly followed by corneal disturbance: It was also found that

disturbances below this ganglion produced simple anesthesia of the cornea without ulceration. In addition, Duval and Laborde proved that when the lesion was situated above in the gray sabstance of the bulb, similar symptoms often followed.

In man, neuroparalytic keratitis is generally found to be the result of an infectious meningitis or is due to compression by tumors. In 1886 Baudry reported a case of neuralgia of the ophthalmic branch of the trifacial nerve which was complicated by corneal ulceration. In animals, experimentally produced corneal ulceration consecutive to operations on the fifth nerve, has been preceeded by slight opacity of the cornea, contracted pupil, injection of the bulbar conjunctiva, and increased intraocular tension. Kalt asks why such symptoms without going on to ulceration, may not occur in man from irritation of the fifth nerve; and in support reports the following cases: Eleven days before having been seen, a sixty-year old woman fell striking the left side of her face. Shortly afterward she developed increasing pains in the upper left face and scalp. Five days later, a redness of the left eye was noticed, followed in two days' time by a commencing failure of vision. On admission there was a slight circumcorneal injection, the surface of the cornea being dull and its parenchyma hazy principally in its lower half. The iris was hyperemic and the pupil was contracted. The anterior chamber was normal. Intraocular tension was slightly increased and corneal sensation was intact. Vision was reduced to the ability to see to count fingers at one meter's distance. Under treatment with the internal administration of pilocarpine and the local use of hot compresses, the pain nearly disappeared, and vision arose to two-thirds of normal. The cornea became clear with but a slight remaining circumcorneal injection.

The second case was that of a single woman of forty-eight years of age who had complained of migraine with suboccipital and periocular neuralgia. In this case, retinal detachment in one eye and peripheral chorioretinitis in the other, developed.

The author concludes that besides the classical type of neurokeratitis that is found following lesions of the ganglion of Gasser, there may be disturbances of the iris, the

cornea, and the chorioretina. In such cases, the causes must be searched for in the still unknown lesions of so-called neuralgia.

The Value of Ocular Examinations in the Diagnosis of Certain Manifestations of Hereditary Syphilis.

PUECH, Bordeaux. (*Archives d'Ophtalmologie*, November, 1901.) Puech believes that to the triad of symptoms the teeth, the keratitis, and the disturbances of hearing, mentioned in the classic work of Hutchinson, should be added an arthritis that especially affects the knee-joints. Of twenty-seven cases of syphilitic keratitis of hereditary type which have consulted the author during a period of six years' time, eleven had an arthropathy; while disturbance of hearing was present in but five instances. The joint lesions also had a most intimate time-relation with the corneal inflammation. He gives three histories in which the presence of the keratitis rendered the etiological diagnosis certain and the cure of coexisting joint lesions possible.

Ocular Wounds Produced by Working Classes.

BOURGEOIS, Rheims. (*Recueil d'Ophtalmologie*, October, 1901.) Bourgeois gives the details of two cases. The first was that of a stone cutter and the second that of a bronze worker in both of whom the injury to the eye was referable to the protecting glasses that had been worn.

A Case of Gigantic Osteoma of the Sphenoidal Sinus.

GALLET AND COPPEZ, Brussels. (*Archives d'Ophtalmologie*, September, 1901.) Gallet and Coppez report the following case. In 1892, a coal miner with a negative medical history noticed failing vision with the right eye. This was accompanied with an increasing right exophthalmos and frontal cephalalgia. Five years later, the eye projected markedly forward and a little down, but it could be still covered by the lids. In the upper and inner part of the orbit a dense hazelnut-sized tumor which was insensitive and produced a slight prominence of the overlying tissues could be felt. The ocular movements were limited, and there were no signs of irritation. Intraocular tension was normal. The media were clear. Postneuritic optic atrophy was present, and vision was reduced to light-perception. The left eye was normal.

Operation was refused. During the following two years,

the tumor increased in size, blindness in the involved eye ensued, and the lower lid ulcerated. A purulent discharge from the right nostril developed, and the frontal cephalalgia reappeared. With these local signs there was marked general depression.

A sinus, six millimeters long, directed horizontally backward and inward, was found opening through the ulcerated area of the lower lid. A retropharyngeal tumor could be determined on the right side. Transillumination of the maxillary sinus was negative. At this time a temporary ligation of the right external carotid artery with an expectant treatment of placing a ligature around the common carotid artery, and a tracheotomy in association with an enucleation of the eye and a temporary excision of the superior maxillary bone were all suggested and in part performed. The tumor was torn loose from the base of the orbit, when it was found to have its insertion in the sphenoidal sinus which was filled with pus. The parts were replaced, a drainage apparatus inserted, and an esophageal tube introduced through the left nostril. Convalescence was uneventful for a period of ten days, when meningitis developed, terminating fatally in twenty-four hours' time,

The authors believe that osteomata of the sphenoidal sinus are distinguished from those of surrounding cavities by the early affection of vision from compression of the optic nerve, external deviation of the globe, and rapid involvement of the cranial cavity.

A Study of Cysts of the Iris.

TERRIEN, Paris. (*Archives d'Ophtalmologie*, October, 1901.) Terrien says that four forms of cyst of the iris are usually described, and in order of frequency are serous, pearly, entozoal, and dermoid.

Pearly cysts are always traumatic in origin and are the results of inclusion of epithelial cells by means of penetrating wounds. Such cysts spring from the anterior surface of the iris to which they are attached by connective tissue and have a true pearly appearance. At times, they are bosselated and may be caused by the presence of cilia. Microscopically, such cysts consist of concentric lamellæ of epithelial cells among which may be found cholesterine crystals. The author has produced such a cyst experiment-

ally. When penetration of the globe has not occurred, the cyst results from the deposition on the iris of cells that have been detached from the posterior surface of the cornea or from the anterior capsule of the crystalline lens.

Dermoid cysts of the iris have their usual etiology. Of the five cysts of this class affecting the uveal tract reported by von Graefe, Cunier, Follin, Rosenwieg, and Lagrange—only one (that of Follin) is without reproach, the others probably belonging either to the serous or the pearly types. Follin's case was that of a seventy-year old female in whom post-mortem examination revealed a rounded tumor of one centimeter in diameter lying between the chorioid and the retina in the upper part of the globe. The surface of the mass was furrowed and corroded, and it was covered with medium sized hairs. Histological examination showed it to consist of several layers analogous to those of the skin and the subcutaneous tissue.

Among the entozoal types of cysts, cysticercus of the iris has never been met with in France, although the subconjunctival form has been relatively frequent. Those of the iris appear in the anterior chamber as small round yellow or whitish transparent vesicles. The condition is often preceded by ciliary neuralgia. The surface of the vesicle is glistening or is finely granular. It usually exhibits a whitish point near its center, corresponding with the seat of the animal. Later, the vesicle enlarges and invades the pupillary area. The cornea becomes hazy, and hypopyon may form. Often there are sufficient signs of motion to differentiate the condition from the serous or pearly varieties of cysts. Filaria has also been described as occurring as minute white points with the later appearance of a small white snake-like parasite in the anterior chamber. The iris becomes discolored, and the eye is rendered blind.

Serous cysts are of great interest. The author reports the following case. A nineteen-year old male without any history of traumatism, showed a translucent thin-walled cyst which covered the upper outer quadrant of the iris. Histological examination proved it to lie in the iris stroma; the iris being split into a thin anterior wall and a thick posterior wall in order to receive it. The cyst-wall was

formed therefore by iris-tissue that was covered with a single layer of endothelial cells. Such cysts may be either traumatic or spontaneous in origin. The former are most frequently observed after cataract extraction or iridectomy and result from inclusion of epithelial cells either from the surrounding parts or from a traumatic closure of the normal crypts on the anterior surface of the iris which are covered with epithelium. The serous types of spontaneous origin are simply retention cysts affecting the crypts as described by Fuchs; a theory advanced by Schmidt-Rimpler and sustained by Treacher Collins, Ginsberg, and the author.

The Excipients of Choice for Certain Topical Applications.

TERSON, Paris. (*La Clinique Ophtalmologique*, November, 1901.) Terson states that vaseline is a poor excipient because it is not miscible with water and will not adhere to the globe. The author finds that a mixture of Liebreich's or seven parts of hydrous lanoline with three parts of oil of vaseline has not the above defects. He has found that it is especially efficient as an excipient for the yellow oxide of mercury which he employs in from three to five per cent. mixtures. He practically recommends iodoformed oil of vaseline when the lids cannot be separated, since it is liquid and can be injected between them. Camphorated water he believes useful because of its astringent action and because the camphor prevents mould formation.

Aspiration—Suction in the Extraction of the Crystalline Lens for Myopia.

TRUC, Montpelier. (*La Clinique Ophtalmologique*, November, 1901.) Truc, encouraged by the simplicity and success of the aspiration of ordinary traumatic cataracts, has employed the method in order to remove the lenses in four myopic eyes. He has found that after one or more discissions, the provoked operative cataract can be easily, and usually, completely removed. The operation when done aseptically, has no serious complications and has given him better results than either the simple or the combined methods of extraction. The procedure is to be especially recommended for relatively young subjects with annular or soft nuclear cataracts.

Subconjunctival Injections of Gelatine.

De Wecker, Paris. (*La Clinique Ophtalmologique*, November, 1901.) De Wecker noting the remarkable results of gelatine injections in aneurisms of the aorta has been led to employ the same material either alone or in combination with three to five per cent. strength solutions of chloride of sodium subconjunctivally instead of the painful injections of ten to twenty per cent. strength solutions of salt. He speaks encouragingly of this method of modifying the osmotic currents more particularly in cases of intraocular hemorrhage. An example of this affection is reported. The patient from frequent hemorrhages into each vitreous humor had the vision of the right eye reduced to poor perception of light and that of the left eye to fair light perception. No retinal reflex was obtainable. With oblique illumination the extravasated blood was visible just behind the crystalline lens. After a six weeks' treatment with bi-weekly injections of a syringeful of a two and a half per cent. strength of gelatine solution, vision with the right eye arose to one-tenth of normal and that with the left reached nearly one-fourth. One year later the treatment was repeated, bringing vision to one-sixth of normal with the right eye and one-half of normal with the left.

The fundus of the left eye could be easily seen and showed the remains of proliferating retinitis, while that of the right eye remained veiled by a haze in the vitreous chamber.

The author has found that the injections are painless and that they are not followed by any reaction if properly sterilized solutions of isinglass and not bone gelatine are used. He states, however, that if these conditions cannot be fulfilled, it is far preferable to employ simple chloride of sodium solutions which are easily rendered aseptic.

A New Needle Curette for Facilitating the Extraction of Hard Cataracts with Large Nuclei.

Charamis, Athens. (*Recueil d'Ophtalmologie*, October, 1901.) The instrument devised by Charamis consists of a small dull curette so hollowed as to carry a fine needle which can be projected at pleasure beyond the tip of the instrument by a lever that is attached to the handle of the

contrivance. It can be used both as a hook and as a lifter, and is thus of value in extracting large hard cataracts.

Clinical Researches on the Etiology of Trachoma in Egypt.

MORAX, Paris, and LAKAH, Alexandria (*Annales d'Oculistique*, November, 1901.) Morax and Lakah have examined the eyes of sixty-three nursing infants in Alexandria, Egypt. The cases were composed largely of abandoned children of European parentage in the care of native nurses. They found that fourteen or twenty-two per cent. presented trachomatous lesions. Of the fourteen nurses in charge of these children, eight were suffering from acute trachoma, five showed cicatrical scars, and one failed to evidence any trachomatous lesions. The mode of infection in eight per cent. of the children was thus plain: of the remainder, the infection was readily traced to children or adults in the family of the nurse, the transmission being due to crowded quarters and uncleanly habits.

Not only trachoma but also other infectious conjunctival conditions were noted. Of the entire number of cases eleven showed acute conjunctivitis caused by the bacillus of Weeks. Of ninety-five children between the ages of two and seventeen years of age in the Sister's school, twenty ranged between the ages of twelve and seventeen years. Of these, seven gave evidence of typical granulations; of the seventy-five children between the ages of two and twelve, fifty-six or seventy-four per cent. were trachomatous.

Students in various schools were examined. In those institutions intended for the very poor, as high as ninety-three per cent. were trachomatous, while in those employed by the better classes but fourteen per cent. were so afflicted.

In one series of one hundred and forty patients, ninety-three per cent. showed recent or old signs of trachoma. In most cases the infection occurred between the third and the sixth years of age, and to this fact they say, is due the marked prevalence of the disease. They believe that practical prophylaxis consists in the artificial feeding of infants with the separation of the infected from the non-infected during school-life. Climate and race, they assert, have nothing to do with the diffusion of the infection.

On Compression and Ligation of the Common Carotid Artery in the Treatment of Pulsating Exophthalmos.

RASCALON. (*Recueil d'Ophtalmologie*, October, 1901.) Rascalon reviews the observations of Lefort regarding the treatment of pulsating exophthalmos. Of seven cases not treated, two became better, two grew worse, and three died, one of the deaths occurring from hemorrhage after operation for a supposedly malignant tumor. Of thirty-seven cases treated by compression, there was a complete cure in three cases, an incomplete cure in six cases, and sudden death in one case; while there was not any result in the remainder.

The author reports the following cases:

1. A sixty-year old married woman sustained a severe fall leading to a fracture of the base of the skull as demonstrated by hemorrhage from the left ear and nostril. There were violent cephalalgia and a roaring sound in the head. No abnormality was noted in the eyes for five days. On the sixth day edema of the right eyelids appeared, followed by an exophthalmos of a phlegmonous nature, associated with a considerable induration of the tissues and violent orbital pain. There was not any pulsation or bruit. On the twenty-third day pulsation with thrill but without any bruit appeared and could be noticed at the inner angle of the upper eyelid. Ocular compression was employed for a period of nine months, causing the disappearance of the exophthalmos but not affecting the pulsation. There was a partial paralysis of the ocular muscles with probable optic atrophy, judging from the complete blindness.

The author believes the orbital swelling was due to an infection from the nasal fossa. The optic atrophy, he thinks, was the result of a strangulation of the optic nerve by compression and that the ophthalmoplegia depended upon either a contemporaneous effect of the accident or vascular distension. He hopes for a spontaneous cure or perhaps as the result of the therapy that has been applied.

2. A forty-four year old female showed evidence of pulsating exophthalmos associated with Basedow's disease. Her family history was negative. Twenty-two years previously she developed the typical symptoms of Basedow's

disease. In August of 1899, she fell, striking her head, left shoulder, and side. She immediately developed a right exophthalmos with loss of vision in the right eye. In eight days' time vision equalled one-sixth of normal, and there was a slight ptosis. There was a moderate chemosis, the cornea was clear, the pupil was slightly dilated, and the iris was immobile. The ophthalmoscope showed that the media were transparent, the retinal arteries were slightly swollen and the temporal side of the disc was somewhat pallid. The left eye was normal.

Ten days later the exophthalmos increased. There was ptosis. The cornea was hazy. There was a slight iritis. The media were hazy, and a view of the fundus was impossible. The patient complained of a sensation like a continued hammering in the right side of the head. Exploratory puncture and palpation gave negative results.

Two days after this there was a distant pulsation of the eyeball with marked exophthalmos and a bruit. Ten days later it was noticed that the globe could be made to assume a normal position and the pulsation and bruit stopped by compression upon the common carotid artery.

In three months' time it was found that all of the symptoms were diminished. At this time it was noted that a compress bandage had been applied from the first.

Under constant compression until July of the following year, all pulsation had disappeared, a very slight *souffle* could be heard with the stethoscope, and the exophthalmos had nearly gone. Vision equalled the ability to see to count fingers at two and a half meters distance.

Clinical Notes on Three Cases of Congenital Nuclear Cataract.

De Micas, Toulouse. (*La Clinique Ophtalmologique*, 25th September, 1901.) While enumerating the congenital malformations of the crystalline lens, de Micas states that cataract is much the most frequent, occurring either alone or with defects in other parts of the eye or body. He cites the instance of a four months' old child, in whom with double congenital cataract there co-existed a unilateral branchial fistulous opening situated just above and to the outer side of the right sterno-cleido articulation. In this case, as in all the others occurring in the author's experience, there was not any history of heredity.

His second and third cases were twins of a few months of age. Their family history was negative. Under atropine with full dilatation the lenses seemed to be uniformly white with no striae and there were not any vacuous reflexes or milky appearances.

Under chloroform anesthesia combined extraction was performed on all four eyes. In two, the lenses came away intact. A slight prolapse of the iris occurred in three of his cases.

The difficulty of diagnosis between soft and nuclear cataracts is emphasized by him, and when in doubt he says, free section with or without an iridectomy should be advised. Operation, he believes, may be postponed until the child is a few months old, in order to await better development of the organ; but too long a delay, he thinks should be advised against both in monocular and binocular cases for fear of amblyopic or strabismic defects.

Contribution to the Study of an Interesting Case of Wound of the Eyeball (Luxation of the Crystalline Lens: Glaucoma: Iridectomy: Disappearance of Myopia)

SCHNANDIGEL, Frankfort-on-the-Main. (*La Clinique Ophtalmologique*, 25th September, 1901.) The patient, a woman forty years of age presented herself to Schnandigel twenty-eight hours after having been struck in the left eye by a piece of wood. She complained of an increasing pain in the organ. The lids were slightly swollen, the globe was deeply injected, the cornea was hazy, especially in its center, and there was a superficial wound in the lower corneal quadrant near the limbus. The pupil was fully dilated and the iris was inactive. There was very poor light reflex. The lens was apparently dislocated into the vitreous chamber, in which place there were numerous dark opacities. The eyeball was stony hard. Vision was reduced to the ability to see to count fingers at one-half a meter's distance. The visual field for hand movements was very good. Instillations of eserine gave immediate relief.

Four days later, the symptoms having returned, an iridectomy was done with the expulsion of some vitreous and blood. In four months' time, uncorrected vision with the left eye equalled one-half of normal, while that of the right eye was the same when corrected for its fourteen

diopters of myopia. Six months later, a central chorio-retinitis developed, causing vision to fall to one-tenth: It again arose to one-seventh with some stationary macular processes and an almost completely opaque lens lying in the lower part of the vitreous chamber.

A Case of Pterygium of the Upper Lid.

MONPHOUS, St. Malo. (*La Clinique Ophtalmologique*, 25th September, 1901.) The patient, a woman of twenty-two years, presented herself to Monphous with an attack of subacute keratitis of a few days' duration. She had a history of a similar attack which had recovered under appropriate treatment some three months previous. There was not any history of any other ocular trouble. Examination showed a slight superficial opacity in the upper and outer quadrant of the cornea. There was very little inflammatory reaction. The condition seemed similar to that which is produced in trachoma. Eversion of the upper lid revealed a distinctly outlined and rose-colored membrane. It was very delicate, somewhat vascular, and triangular in shape. Its apex, which was slightly the more prominent, was situated at two millimeters' distance from the median line. Its base extended to the upper cul de sac reaching from the outer angle of the commissure to the caruncle. Its apex was firmly adherent to the mucous membrane and the tarsal cartilage, while its body and base were partly free. The corneal disturbance was believed to be due to its presence.

Operation was suggested and refused. Examination of the fellow eye showed that, though it was normal in every respect, the corresponding upper lid exhibited a similar yet smaller growth as on the other side. The apex of this growth was situated sufficiently beyond the median line to avoid irritating the cornea. Two years later it was found that the growths had not changed in any way except that their heads had become less prominent, this being due the author believes to the employment of an ointment of yellow oxide of mercury.

The bilateral character of the disturbance the author thinks completed its etiology with the classical types of pterygium. In this case the pterygia beginning in the cul de sacs progressed along the line of the palpebral conjunctiva rather than along the bulbar. He

is inclined to believe that pterygia are of microbic origin, citing Poncet who had described the presence of a micrococcus in such cases, offering as reasons, the progressive and the relapsing characters of the disturbance; thus making it the more probable that there is a special type of morbid proliferation rather than a simple form of hypertrophy.

Treatment of Trachoma..

CATNAROVICZ, Varsovia. (*La Clinique Ophtalmologique*, 25th September, 1901.) Catnarovicz, after reviewing the history, topography, and treatment of trachoma, advises general cleanliness, good food and air, with irrigation of the conjunctival sacs and lacrimal ducts with benign washes. Should any large vascular granulation with abundant secretion be present, he makes use of one or two per cent. strength solution of nitrate of silver. If the granulations should be small and hard, he employs sulphate of copper. In both conditions he thinks well of cold compresses.

Where expression is permissable, he advises the use of Knapp's roller forceps without previous scarification: followed in accordance with the condition of the case with the employment of sulphate of copper, nitrate of silver, frequent irrigations and cold compresses. Ulcers and even abscesses of the cornea are complications he treats with atropine or eserine as he thinks necessary. Bandages and hot compresses he has found are to be avoided. As a last resort, he believes that jequirity may be employed.

Public education as to the infectiousness of the condition, the establishment of hospitals and wards for the treatment of ophthalmic cases, with special study of the disease by physicians, all are strenuously urged.

Anesthesia in Exenteration of the Eyeball.

BRUNSCHWIG, Havre. (*Annales d'Oculistique*, October, 1901.) Brunschwig comments upon the dangers of a fatal issue in general anesthesia by chloroform and ether, and of the insufficiency of cocaine instillation and subconjuntival injections in such cases when the stump is painful. He instills cocaine, dissects loose the conjunctiva in which he intends to insert any sutures, and administers ten to fifteen grammes of bromide of ethyl by means of an ordin-

ary chloroform inhaler. By this plan, he has found that anesthesia is complete in forty seconds' time, and that it lasts for a period of about one minute; during which he says, the section of cornea and the curretting of the globe can be accomplished. Five cases in which this method was employed to advantage are reported.

Treatment of Affections of the Lacrimal Passages by Means of Sounds of Gelatine Protargol.

ANTONELLI, Paris. (*Annales d'Oculistique*, October, 1901.) Antonelli has found that sounds of gelatine protargol are effective in affections of the lacrimal passages. For their use a more or less complete section of the canaliculus is indispensable, and a stricturotomy is often useful. Gelatine is the preferable excipient because of its strength, its flexibility, and its solubility. The sounds ordinarily employed by him are equal in size to number four caliber. They are introduced after the withdrawal of a number five or six metallic sound.

He has found that the results obtained by these sounds are undoubtedly better than those that are gotten by injections of protargol or other substances. He believes that this is due to the fact that there is a prolonged contact and some peculiar diffusibility of the organic salt of silver. He has employed sounds containing even fifty per cent. of protargol and has always found that they are well borne.

Once More Primary Glaucoma in the Orient.

BITZOS. . (*Recueil d'Ophtalmologie*, September, 1901.) Bitzos concludes that primary glaucoma is no more frequent in the orient than it is elsewhere. He has found that secondary glaucoma is of greater frequency in Egypt than it is in Constantinople, due he thinks to the greater prevalence of trachoma and purulent conjunctivitis in the former place. He also says that secondary glaucoma is no more to be feared in the orient than elsewhere; and in fact, very probably it is less dangerous. He believes that in cases of corneal perforation with prolapse of the iris, immediate surgical interference with iridectomy is contraindicated by the greater danger of infection from the exterior than when the same procedure is performed later. Iridectomy and sclerotomy, he asserts, are likewise less efficacious, and as but little indicated in cases in which

there is an absence of increased tension and not any symptoms of irritation.

The Treatment of Suppurative Keratitis.

PERRIN. (*Recueil d'Ophtalmologie*, September, 1901.) Based upon experimental studies upon the use of antiseptic injections into the anterior chamber, Perrin arrives at the following conclusions: Antiseptic injections into the anterior chamber appear to be useful in the treatment of suppurative keratitis accompanied with hypopyon iritis, or irido-chorioiditis. The beneficial effect of the injection is as distinct in cases of streptococcus and pneumococcus infection as it is in abscess that has been provoked by the staphylococcus. Injections into the anterior chamber require more delicate manipulation than subconjunctival ones do; but on the contrary, they have the advantage of being less painful, and of producing quicker and more certain results. The injections (at least those of cyanide of mercury) are without action on the corneal endothelium, and in man it is believed that a one to five-thousand strength solution will lead to a more rapid cure.

The injections are made with a hypodermatic syringe, the needle passing through the corneal margin just in front of the iris. The use of the miotic is advised in order to avoid injuring the crystalline lens. In thirty animals studied by the author, the cyanide of mercury was used in solutions varying from one to one-thousand to one to three-thousand strengths. One to three drops were injected at a time.

Concerning the Value of Electrolysis in the Treatment of Retinal Detachment.

MARAVAL, Oran. (*La Clinique Ophtalmologique*, 10th September, 1901.) Maraval disbelieves in the tentative treatment of retinal detachment, having found that electrolysis serves as the most valuable therapeutic means. The puncture of the needle, he says, allows a partial escape of the serous exudate, favors the formation of adhesions, and increases the general ocular nutrition.

He employs a five to a five and a half milliampere current passed for one minute's time, and controlled by a rheostat. In addition to the electrolysis, he makes use of

subconjunctival injections of bichloride of mercury in solutions of one to fifteen hundred or one to two-thousand strengths. These, he says, should be commenced four days after the use of the electrolysis. The injections seem to maintain the effect of the electrolytic action. After the employment of electrolysis, a compress bandage is to be applied. It should be employed for four days' time. The patient is to be confined to his bed for a period not exceeding six weeks. The electrolytic procedure may be repeated, the author having applied it three times in one case.

Ten cases are reported, two having been cured, and the remainder much benefited. None of them were of more than one month's duration.

Diagnosis of Malignant Intraocular Tumors in Infants.

SOURDILLE, Nantes. *(La Clinique Ophtalmologique*, 25th October, 1901.) Sourdille emphasizes the great difficulty in the differential diagnosis of intraocular tumors, neither the so-called "amaurotic cat's eye" or increase of intraocular tension being absolutely pathognomonic symptoms.

In his own experience, three of the ten eyes that he had enucleated for glioma had proven to be nothing but cases of pseudo-glioma. He cites two interesting examples: The first was that of an infant of a few months of age, with a family history of tuberculosis. After having shown the characteristic amaurotic cat's eye for several months' time, the child suddenly developed the usual subjective and objective signs of a severe iritis. A nodular condition of the iris with diminished tension, led to a diagnosis of tuberculous iritis. Section of the globe demonstrated a tubular form of glioma.

The second case was seen in a five-year old child who, eight days before being seen, noticed a violent pain in the left eye which was the seat of congenital cataract. Examination showed the usual symptoms of acute glaucoma with the addition of a yellowish irregular body situated in the pupillary area. Glioma was diagnosed, but section revealed the presence of a persistent hyaloid artery with a vascular lens sheath. To this membrane separating the anterior and the posterior chambers, was attributed the glaucomatous state. The author recommends transillumi-

nation and puncture as aids in the differential diagnosis of such intraocular conditions.

Experimental Investigations of Intraocular Tension in Mexico.

URIBE-TRONCOSO, Mexico. (*La Clinique Ophtalmologique*, 25th October, 1901.) Uribe-Troncoso has, with the aid of a special manometer, determined the intraocular tension of thirty-one rabbit eyes. Sixteen times a puncture was made into the vitreous chamber and fifteen times the anterior chamber was tapped—giving an average of 21 mm. in contrast with the 25 to 26 mm. that have been reported by Leber and others in Europe, The author speaks of the accepted interrelations of atmospheric and blood pressures and deals with the vaguely mentioned interassociation of blood pressure and intraocular tension. By means of a study of quiet and struggling animals and of animals in which the blood pressure had been augmented by intravenous injections of normal salt solutions, he has demonstrated that the increased blood pressure is accompanied with a corresponding change in intraocular tension.

He has likewise studied the tension of the eyeball under increased barometric pressure which he obtained by means of a pneumatic chamber. As a result, he has found a corresponding increase of the former with the latter.

Papillary Stasis of Traumatic Origin. Trepanning, Followed by Recovery.

CHESNEAU. (*La Clinique Ophtalmologique*, 10th September, 1901.) The case seen by Chesneau was that of a forty-year old fisherman who had sustained a fall. He received a severe blow on the occiput, which dazed him but did not render him unconscious. Six days later he noticed a slight failure of vision. Examination showed a paralysis of the sixth pair, and a slight serous suffusion of both optic nerve heads. Vision with the right eye equaled two-thirds of normal. Vision with the left eye was nearly normal. There were not any signs of fracture of the cranial bones. Ten days after this the strabismus had disappeared. Vision with the right eye had fallen to one-sixth and that with the left eye had become one-third. There were marked edema of optic discs and lancinating

headaches. No disturbance of gait, station, or sensation could be obtained. Twenty days after the injury cranial trepanning was done, revealing a marked increase of intracranial pressure. The patient's convalescence, except for the formation of cerebral hernia on the fourth day, was uneventful. One month after the operation the recovery was completed with a vision of two-thirds in each eye.

The author quotes a similar case reported by Babinski. Regarding the pathogenesis, he states that he believes the paralysis of the sixth pair was the result of a slight injury of the nerve trunks, while the edema of the discs was produced by hydrops of the nerve sheaths. He advises the obtainance of a large trepan opening in order to avoid cerebral hernia.

Two Cases of Congenital Ptosis Operated Upon by the Motais Method.

DELBES, Peregne. (*La Clinique Ophtalmologique*, 10th October, 1901.) The operation made consists in the baring of the tendon of the superior rectus muscle, with the cutting of a median flap three millimeters' wide and seven millimeters' long into this, followed by an attachment of the same to a button hole that has been made in the upper border of the tarsus.

The first case was that of a five-year-old child with complete congenital ptosis of the left upper eyelid. The right eye was healthy in every respect. Vision in each eye was normal.

After operation, an occlusive dressing was applied to both eyes. Upon the removal of the dressing in forty-eight hours time, the lids were found to be partly open, and there was a corneal ulcer on the operated side. The ptosis was completely relieved except for a slight difficulty in closing the lids. In spite of the most careful treatment, the ulcer of the cornea grew worse followed by a staphyloma.

The second case was in a patient of twenty years of age. There was a complete congenital ptosis of the left upper eyelid. Vision in each eye was normal. The operation was made during chloroform anesthesia followed by a closure of the palpebral fissure by a median suture. An occlusive dressing was applied to both eyes.

Five days after the procedure, the result was found to be perfect. A slight amount of diplopia for distance with a moderate difficulty to effect a complete closure of eyelids appeared for a brief period of time.

He follows Motais' recommendation for general anesthesia during the operative procedure in order to avoid any distortion of the field of operation from undue movements of the parts. He insists upon a union of the eyelids by a suture so as to prevent keratitis from lagopthalmos.

Dermoid Cyst with Oily Contents Situated at the Angle of the Left Orbit.

CHAVASSE, Paris. (*Archives d'Ophtalmologie*, October, 1901.) Chavasse reports the case of a twenty-three year old farmer who applied for the relief of a chronic inflammation of the middle ear. Examination revealed a septal spur occluding the left nasal passage. There was a highly arched palate, enlarged tonsils, and adenoid vegetations in the pharynx. At the inner angle of the left orbit just above the lacrimal sac a small tumor of about the size of a walnut could be seen. It was covered by normal skin containing a few dilated veins. It fluctuated and was painful. It was not affected by coughing or other expulsive efforts. It was free from the lacrimal gland and did not produce any mechanical deviation of the eyeball. There was a slight restriction of movement during attempts at elevation of the upper lid. Transillumination revealed the fact that the tumor was translucent. Its extirpation was performed without difficulty and convalescence was uneventful. The contents of the cyst were found to be principally composed of a clear pale yellow fluid which immediately coagulated. Upon examination, the fluid proved to be sterile and to consist of forty-four parts of palmitin and fifty-six of olein. The internal wall of the cyst resembled a macerated cutaneous surface.

Study of the cyst wall with the microscope showed its structure to be the same as that of normal skin with its epidermis and other elements. The epidermis was lacking in a few places only. In other situations it was thinned, and the seat of depressions. The true skin was normal, except that the nerve elements of the papillae were indistinct. No sweat glands were present, but seba-

ceous glands were numerous in that part of the cyst wall which was covered by the skin.

The author believes the term prelacrimal cyst should be discarded since the cysts are situated above the lacrimal sac.

A Study of Ptergium: Its Pathogenesis and Pathologic Anatomy.

TRAPESONTZIAN. (*Archives d'Ophtalmologie*, October, 1901.) Trapesontzian reports the case of a twenty-one year old man who had had his right eye injured by a piece of wood when he was four years of age.

Examination showed a fleshy mass almost covering the cornea and joining the eyeball to the lower lid. The tissue was excised from the cornea, but the patient returned a year later with ectropion of the lower lid and the cornea covered with a band of vascular mucus membrane that joined it to the lid margin. A second operation gave some improvement.

The left eye exhibited an adherent pterygium in its upper part. The cornea was largely covered at its lower free border. The growth was excised and the patient was discharged as cured. Two months later, a relapse occurred and a second operation was performed. Since then two relapses ensued. The author believes that this was a true pterygium at the upper outer corneal quadrant in spite of its position. Pemphigus, he thinks, is excluded by the absence of conjunctival atrophy and bullae of the eyes or elsewhere.

Pathological examination of the primary ptergium on the left eye failed to reveal the presence of any bacteria. The epithelial covering resembled the conjunctiva. In places its cells had undergone mucoid degeneration. Scattered throughout it, were collections of epithelial cells, some of which resembled normal lacrimal gland structure. The stroma consisted of hypertrophied connective tissue containing numerous engorged bloodvessels with linear areas of leucocytic infiltration. The superficial corneal tissue was irregular with an increase of the fixed cells and leucocytes.

The pterygium was considered of spontaneous origin and its progression was due, he thought, to a special predisposition of the patient and to the movements of the upper

eyelid. The author reviews the anatomy of typical pterygium and concludes in brief, that the pathological anatomy of pterygium does not sufficiently explain its genesis; that pterygium usually begins as a pinguecula as demonstrated by the presence of the debris of the latter; that hyaline degeneration affects both the hypertrophied connective and the elastic fibres; that pterygium may not be preceded by pinguecula, but that it has the same histology as if it had; that the process always passes beneath the corneal epithelium; and finally, that it is impossible to assert whether a pterygium is the result of active proliferation of connective tissue or the effect of a passive accumulation of tissue due to the movement of the eyelids during favorable conditions.

The Treatment of Essential Hemeralopia by the Ingestion of Liver, Either Boiled or Roasted.

TRANTES, Constantinople. (*Archives d'Ophtalmologie*, November, 1901.) Trantes has successfully treated forty cases of essential hemeralopia by the ingestion of boiled or roasted sheep's liver. The last twenty-four cases occurred as an epidemic in an orphanage, and for the most part were accompanied with conjunctival xerosis. All the cases, except one which responded in six days' time, were cured in periods varying from twenty-four to forty-eight hours. As a rule, three or four meals, including two hundred grammes of liver each time, were sufficient. Later, in order to prevent relapses, liver was given at intervals. Chronic cases, he states, even of years' standing, have responded readily to this form of treatment when all other measures have failed. Two cases of hemeralopia, one accompanying a chronic hepatic affection and the other seen in association with neoplastic cachexia from gastric sarcoma, he says, were likewise relieved in spite of the fact that the latter case terminated by death.

Exophthalmos Cured by Malar Orbitotomy.

ROLLET, Lyons. (*Annales d'Oculistique*, November, 1901.) Rollet reports the case of a forty-two year old man who, with a negative history, developed an increasing cephalalgia three years before his having been seen by the author. One month before the study of his case, right orbital pain with exophthalmos on the corresponding side

developed. Examination showed that there was marked right exophthalmos with limitation of ocular motion, complete ptosis, optic neuritis, and vision reduced to one-third of normal. The findings of transillumination were negative. The left eye was healthy.

Three weeks later there was such a marked increase of pain, visual defect, and systemic weakness, that surgical intervention was advised and performed.

Under ether, an incision from the external angular ligament to the middle of the lower orbital margin, with a slight extension of the upper end to the temple and of the lower one to the cheek was made through the soft tissues. The maxillary, the frontal and the zygomatic processes of the malar bone were divided with a chisel and a mallet, and the bone was pushed downward and outward in order to allow free inspection and palpation of the depths of orbit. No pathological lesion was found. The parts were replaced, gauze drainage was introduced into the orbital cavity, and a dressing was applied.

Six months afterward, it is reported that the patient had continued free of pain. The exophthalmos had disappeared. Ocular and palpebral motion were almost normal, but postneuritic atrophy with consequent blindness was present.

The cause of the exophthalmos, the author says, is obscure, but possibly it was, he thinks, the result of plastic inflammatory changes from toxines. The operation performed was preferred to that of Krönlein.

Ophthalmoplegia in Syphilis.

Jocqs, Paris. (*La Clinique Ophtalmologique*, 10th December, 1901.) Jocqs reports the following case: A male aged twenty-seven years, who eight years previously had acquired syphilis that had been imperfectly treated, stated that eight months before he was seen for the first time, he had noticed difficulty in seeing near objects, this being associated with a slight drooping of the left upper lid. Examination showed that the pupils were moderately dilated. The irides were absolutely immobile, and there was an almost complete paralysis of accommodation. The eyegrounds were healthy. Corrected vision in each eye was normal.

After eight days of treatment by hypodermatic injections

with bichloride of mercury, a consensual movement of the right pupil to light-stimulus appeared.

The author reviews the literature of syphilis in its relation with ophthalmoplegia, and comes to the conclusion that the lesions are more often basal than they are nuclear, even in the disassociated types of palsy of the third pair. While knowing, he says, that monocular internal paralysis has been particularly thought to be dependent upon nuclear involvement, he has seen such cases, however, recover and believes that this result would have been impossible had they been nuclear in character. He asserts that pressure of exudative material in the interpeduncular space is a much more probable cause.

The Injection of Solid Paraffine in Ophthalmology.

BROCKAERT, Ghent. (*La Clinique Ophtalmologique*, 10th December, 1901.) Brockaert believes the method will be of permanent and of definite value. He states that Gersung first employed it by injecting a mixture of solid paraffine and of liquid paraffine melting at thirty-eight to forty-five degrees centigrade. In two of the reported cases, pulmonary embolism resulted. He informs us that Eckstein, in order to avoid this complication, used a paraffine made with a much higher fusion point. Brockaert found the injections nonabsorbable and says that they become completely enclosed in cystic pouches. Rohmer, he tells us, has employed the method in five cases of enucleation and has obtained very movable stumps. In a case of epicanthus with a flattened nasal bridge, the author corrected both defects by the subcutaneous injection of the material.

Some Radiographic Reports of Foreign Bodies in the Eye and Orbit.

BOURGEOIS, Rheims. (*Annales d' Oculistique*, November, 1901.) Bourgeois divides radiographic methods into two kinds: precise radiography and practical radiography.

Precise radiography by the method of Guilloz, he says, consists in obtaining double images by means of double tubes or by changing the pose of the patient. This plan he believes, is complicated and is not without danger to the subject. He has found that practical radiography is usually sufficient, and gives us the details of the method.

The patient lies on the injured side. The face is slightly inclined toward the plate, with the temple and cheek ap-

plied to it. The eyes are kept closed. In most instances the results obtained by such an exposure are all that is sufficient, but if they are not, an antero-posterior exposure may be made while the patient is seated before the plate.

The author places the tubes some forty or fifty centimeters' distance from the plate. The duration of the exposure is made for about fifteen minutes' time. To orient the foreign body he employs two flattened grains of lead, one of which is placed above and the other below the eye, at the orbital margins, and on a vertical line passing through the pupil. The distances between the lead grains, between the upper grain and the pupil, and between the line joining them and the cornea, are recorded. Based upon these data and knowledge of the usual orbital and ocular dimensions, the situation of the foreign body can be easily located. He says that from the lateral plate the lateral displacement of the foreign body can be judged by the distinctness of the shadow. By means of circles carried around the pupillary center, he estimates the position of the foreign body on the antero-posterior plate.

He reports seven cases, in two of which the foreign body was in the globe, one in the optic nerve, and four in the orbit. In one instance in which the foreign body was in the globe, an intense cyclitis followed the radiographic study, the result he believes of the action of the coil on the magnetized foreign mass.

A Case of Microphakia.

CORDIALE, Novara. (*Annales d'Oculistique*, November, 1901.) Cordiale gives the mathematical and the physical data of a case of unilateral microphakia occurring in a woman of thirty-four years of age. The condition was considered as an anomaly of development, since it was analagous to that which is usually found at one year of age, i. e., in which the corneal curvature is slightly increased, and the curvature of the lenticular surfaces is much greater than they are in the adult.

The Corneal Wound in Cataract Operation Upon Man.

HOCQUARD. (*Annales d'Oculistique*, November, 1901.) Hocquard has studied eight eyes that were removed at varying periods after the operation for cataract extraction.

The incision, which at the time of operation seemed to

lie at the limbus was found to be situated in the corneal tissue two millimeters anterior to the ciliary tendon at a position corresponding with the membrane of Descemet and one millimeter at the anterior epithelial layer. This apparent error he says, was due to the encroachment of the epithelium of the conjunctiva upon the cornea. The incisions did not lie in one plane, but they were arched, angulated, or irregular. He says that immediately after the obtainance of the incision, the corneal lacunae collapse and both corneal surfaces roll toward one another. The incurving of the anterior epithelial layer is apparently due, he believes, to the expansion and the sliding of its cells, and often amounts to a degree equalling 1/5th of the thickness of the cornea. Beneath this layer, the corneal lacunae secrete a fibrinous fluid which provisionally unites the wound margins. The superficial corneal layers then unite firmly by means of cellular diapedesis, new vessel formation, and true organization. The deeper layers unite by the retraction and the organization of the primal fibrinous exudate which later reacts to stains similarly with the corneal lamellae proper. Descemet's membrane agglutinates not end to end, but in an overlapping manner and is held in this position by a fibrinous exudate.

In an eye that had been removed thirty-six hours after operation the union of the flap was firm although that of the more deeply seated corneal layers was still feeble.

This anatomical fact he believes, is in favor of the conjunctival flap. In an eye that had been removed eleven days after operation, the union was firm but inflammatory signs with enlargement of the corneal lacunae and of the fixed corneal cells were still marked. This slow cicatrization, he believes, probably permits the adjustment of the cornea with consequent diminution or compensation of the marked astigmatism that is the necessary result of such a section.

Double Optic Neuritis After Meningitis Following Gastro-Intestinal Intoxication.

STOCKE. *(La Clinique, Ophtalmologique,* 10th December, 1901.) Stocke reports the following case. One month before being seen, a two year old female with a history of chronic gastro-intestinal trouble, became somnolent and remained so for fifteen days' time. She then improved,

but was unable to see, to talk, or to walk. Examination showed a poorly nourished child with a distended abdomen.

Her attention was held with difficulty and fatigue soon appeared.

The cranium was well developed though somewhat flattened superiorly. There was bilateral nystagmus. The pupils were dilated and the irides were immobile. Vision in each eye was lost. There was a moderate degree of double optic neuritis. There were not any gross evidences of syphilis. Hygiene with mercurial inunctions and small doses of iodide of potassium were ordered and employed with the result of restoration of health and a return of the faculties.

Regarding Jequirity.

LAPERSONNE, Lille. (*La Clinique Ophtalmologique*, 10th December, 1901.) Lapersonne agrees with Romer in reference to the anatomical findings after applications of jequirity; i. e., enormous leucocytic infiltration with the transudation of serofibrinous fluid. With these, he says, there is a true leucocytic thrombosis of the fine veins of the conjunctiva and cornea; the latter condition explaining the rapid disappearance of the pannus.

He has found Merck's carbolized solution of abrin to be unreliable and prefers a one-to-twenty strength infusion of the drug which he rubs upon the conjunctiva with a cotton applicator. He refers to the antiabrin serum, but states that it has no clinical application since it will control the effect of the jequirity only when it is applied within forty-eight hours after the employment of the drug: It is only after this period that the menacing effects usually develop.

Orbital Heteroplasty by the Insertion of the eye of a Rabbit into the Capsule of Tenon: Later Result.

LAGRANGE. Bordeaux. (*Annales d'Oculistique*, November, 1901.) Lagrange has engrafted the eye of a rabbit into Tenon's capsule in eleven cases. He has had but one failure. In the case reported in this communication, the transplanted eye softened and lost one-third of its bulk in three months' time. It then remained stationary in size. The author recommends the procedure.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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(Quarter ending December 31, 1901.)

Remarks on Closure of the Lids During Sleep in Paralysis of Facial Nerve.

HERZFELD, J., M. D. (*Berl. Kl. Woch.*, 1901, p. 904.) In a case of paralysis of both facial nerves, owing to necrosis of both labyrinths, the palpebral fissure could not be entirely closed, except during sleep. This case shows, that the closure of the lids during sleep is not always brought by active contraction of the orbicularis alone, but also by the relaxation of tonus of the smooth muscles of Müller in the upper and lower lids and of the smooth muscular fibres of Tenon's capsule which are supplied by the sympathetic nerve and act as antagonists to the retracting power of the four recti. If finally the pressure of the lids pushes the globe further back, the lids can be closed completely. It is anologous to the contraction of the pupil in sleep from relaxation of the dilatator pupillae which is also supplied by the sympathetic nerve.

Stereoscopic View of the Fundus of the Eye.

THORNER, W., M. D. (*Berl. Kl. Woch.*, 1901, Nos. 38-48.) T. devised a new instrument which is an improvement on the binocular ophthalmoscope of Girand-Teulon and does away with the disturbing corneal reflexes by separating the rays for illumination from those for observation conduction

of such in special tubes, one for illumination and one for observation. These are isolated by the projection of an optical real image of a septum, which is attached to the lamp between the anterior opening of the apparatus and the The description must be read in the original.

The Supraorbital Reflex.

McCarthy. (*Neurolog. Cent. Blatt*, 1901, No. 17.) A new reflex: If the skin, supplied by the supraorbital nerve, or the nerve itself are tapped with the percussion hammer, the orbicularis palpebr-twitches. It may be of diagnostic value in supposed intracranial, especially nuclear, affections.

On Trachomatous Dacriocystitis and the Cause of Acute Dacriocystitis.

Raehlmann, E. (*Deutsche Med. W.*, 1901, p. 747.) R. proved histologically trachoma of the lacrimal sac. His specimens showed numerous trachoma-follicles and their pathological metamorphoses leading to ulcerations by sloughing and evacuation of the follicles, and exposing the submucous tissue. Thus the frequency of acute dacriocystitis in trachoma is explained by the entrance of pyogenic agents in the tear sac into the submucous tissue. The follicular ulcers of the tear sac also cause the obstinacy of trachomatous dacriocystitis and the strictures of the sac, so frequently observed in this disease, which are the result of the same process of shrinking as in the conjunctiva. From these conditions results a more general indication for extirpation of the lacrimal sac.

On the Pupillary Phenomenon of Westphal.

Schanz, F., M. D. (*Berl. Klin. W.*, 1901, p. 1065.) This phenomenon, which consists in contraction of the pupil when the attempt is made to close the eye by energetic contraction of the orbicularis muscle, while the lids are held apart. and was observed by W. in most cases of reflex immobility of the pupils, and explained as a concomitant notion, analogous to the movement of the eyeball upward and outward in closing the eye. S. observed the same in atropine-mydriasis and in a case of complete incurable interior ophthalmoplegia, in which a concomitant irritation of the paralysed nerve was excluded, and infers that it is due simply to the mechanical pressure upon the

eyeball. Only one conclusion is permitted, viz., that pupils showing this phenomenon, are not normally innervated, else the normal reaction to light would disguise the mechanical contraction. In his reply (ib. No. 49) Westphal leaves the diagnostic value of the phenomenon undecided.

On Pupillary Reaction in Severe Optic Neuritis.

HIRSCHBERG, J., ib. No. 47. The physiologic dilatation of the pupil (of the ordinary size of 3 to 4 mm.) amounts to about 1 mm. In an eye blind from disease of the optic nerve the pathologic dilatation of the pupil is very prompt and excessive upon shading its healthy fellow, while the pupil does not respond to light directly. Therefore this pathologic pupillary dilatation and this indirect pupillary reaction are unfailing syptoms of total blindness of one eye, and of great differential diagnostic value from hysteria. H. illustrates this on a case of severe optic neuritis (of unknown origin) which recovered, and shows that a slight return of direct pupillary reaction is a favorable prognostic symptom.

The Semi-Centennial Anniversary of the Discovery of the Ophthalmoscope.

von HELMHOLTZ, H. (R. Greeff, ib. No. 47 and 48, and D. M. Woch. No. 48, V. B.) The meeting of the physicians of the Royal Charité of Berlin, held on November 14, 1901, in the newly instituted ophthalmological clinic of the Charité, was a jubilee meeting in honor of the semicentennial anniverary of the discovery of the ophthalmoscope, by H. von Helmholtz, who demonstrated it before the society of scientific medicine at Koenigsberg, Nov. 11, 1851. Prof. Greeff set forth the importance of the ophthalmoscope for the entire medical world and reported new dates by reading a letter of Helmholtz to his father, written Dec. 17, 1850, and a protocol of the Physical Society of Berlin, of Dec. 6, 1850, which refer to his discovery. G. exhibited more than 100 models of the ophthalmoscope displaying its technical development.

HIRSCHBERG, J. (ib. No. 48) opened the winter session of the Berlin Ophthalmological Society with the same subject. From his experience with the ophthalmoscope for 35 years, H. states that, even if not all far reaching expecta-

tions have been fulfilled, the ophthalmoscope has yielded an unthought-of abundance of new facts, inaugurated modern ophthalmology, shed light on the darkest fields of general medicine and has become an indispensable diagnostic aid for every physician.

Sympathetic Ophthalmia.

ZUHOENE, TH. (*Inaug, Diss.*, Giessen, 1901.) Z. reports in tabular form, 14 cases of sympathetic irritation and 11 cases of sympathetic inflammation, out of 4000 cases of injuries, observed in the eye clinic of Prof. Vossius in Giessen, from 1890 to 1900, i. e., 0.25 per cent. Four cases are given in detail. One showed sympathetic serous iritis and marked inflammatory changes of the optic nerve with favorable termination after enucleation of the exciting eye and energetic mercurialization. By enucleation of the exciting eye the danger of the other eye is not entirely eliminated. If, during a term of observation from three to four weeks after the operation, the second eye shows no inflammation, sympathetic ophthalmia may be regarded as prevented. An inflammation of the second eye after a still longer interval is not to be attributed to the enucleated eye or to the operation. In such cases other moments must be considered, especially an exact general examination has to be made. Very instructive in that respect is a case in which serous iritis with synechiae and retinal hemorrhages occurred in the second eye eleven and a half weeks after enucleation of the first eye which had become inflamed, phthisical and painful after a cataract extraction, performed elsewhere. The patient had diabetes, was not careful in his diet, and contracted a severe cold so that his iritis was due to these conditions and was not sympathetic. In a third case sympathetic ophthalmia broke out after enucleation of the injured eye (which had been refused, when advised in proper time), in the course of typical panophthalmitis. The affection commenced in the optic nerve with central scotoma, while the inflammation of the uvea was observed after several weeks. The apparent cause was an infection, through a piece of glass which had pierced the cornea, and was conveyed into the eye by cilia, as proven microscopically. The bacteriological examination was negative. In spite of energetic treatment the sympathetic ophthalmia ended in blindness.

Extirpation of the Lacrimal Sac.

BRANDES, H. (*Inaug. Diss.*, Giessen, 1900.) Aftergiving statistics from other clinics, B. reports 97 cases, operated upon in the eye clinic in Giessen (1890-1900) and describes the mode of operating of Prof. Vossius, which deviates somewhat from the method of Kuhnt. In contrast to other clinics the percentage of children was high (34.01 per cent. between one and twenty years) due to the frequency of tuberculosis and scrophulosis in that region. The most frequent cause was dacriocystoblenorrhea (73 cases). Except in 3 cases, the wound healed per primam on an average within five days. In 36 cases the sac could be removed in toto, in numerous others in pieces. In a boy, aged 11, purulent cellulitis of the orbit with retrobulbar optic neuritis followed, leading to partial atrophy of the optic nerve.

Extirpation of the Casserian Ganglion.

HOHN, J. (*Inaug. Diss.*, Giessen, 1901.) A farmer's wife, aged 56, who continued to work out of doors in wind and weather, lost the sight of the right eye after extirpation of the ganglion. Cornea anesthetic at once. Two weeks after the operation ulcer of cornea, slight hypopyon, and a few smaller defects of cornea showed themselves. The patient did not submit to treatment. A thick whitish grey opacity developed, which was soft and showed ballottement on the aqueous and, in looking upward, formed a depression. The movements of the enophthalmic globe were normal.

Hemorrhages into the Vitreous, with Eight Cases of Spontaneous Relapsing Hemorrhages.

BENING, F. (*Inaug. Diss.*, Giessen, 1901.) In seven cases the hemorrhages apparently were in connection with chorio-retinitis. One of them which is reported in great detail showed numerous relapses during observation over ten years. Considering that the patient suffered from frequent epistaxis in his childhood it seems that the bloodvessels in the choroid and ciliary body had undergone a peculiar alteration. Here the hemorrhages generally started from points of extensive vascularization and adhesions of the membranes of connective tissue (which had formed from former extravasations) to the chorio-retinitic foci. In two patients the hemorrhages came from

the retinal vessels, in six a connection with retinal vessels could not be determined. In one the degeneration of the bloodvessels was syphilitic, in the others the cause of the chorio-retinitis and the hemorrhages could not be disclosed.

A Case of Acromegaly with Visual Disturbances.

BATTES, R. (*Inaug. Diss.*, Giessen, 1901.) After a review of ocular affections in acromegaly, B. reports the clinical history of a girl, aged 23 1/2, in whom there was cessation of menses when 20 years old. Then the right eye showed divergent strabismus, optic disc white. L. slight pallor of temporal half of optic disc. Considerable contraction of the visual field and a sector shaped defect for colors outward and downward. VL = 1. VR fingers at 2 meters excentrically. The treatment with thyreoidin tablets had no lasting effect and had to be discontinued, as they caused drowsiness.

Injuries of the Orbit.

CIRE, EMIL. (*Inaug. Diss.*, Giessen, 1901.) 35 cases out of 36409 eye patients, from 1890 to 1900, in tabular form. The following case is of interest: A boy, aged 15, ran a stalk of straw into his left orbit. In the lower lid, 0.5 cm. from the outer angle a wound, 2/3 mm. long, through conjunctiva and tarsus toward the fornix, and an irregular defect of the ocular conjunctiva. Globe intact. Vomiting from the first night for several days. After twelve days suture of the wound followed by primary union. Ten days later continuous vomiting and headache on left side. Protrusion of left globe, chemosis. Incision of the scar liberates two teaspoonfuls of thick pus; tampon. After three days pain in swallowing, but incision of soft palate yields no pus. Patient looks collapsed and is very anemic. After five weeks again vomiting, fever and pain in right side of head. Granulation in wound, but no foreign body. Nine days later death. Post mortem: Left orbit without changes. Abscess in anterior portion of right frontal lobe of the size of a plum with softening around and propagation of pus along the vessels of the pia mater over the whole frontal and parietal lobes as far as the central gyrus. At the region of the coronary suture rupture of the perivascular pus into the longitudinal sinus. The septic stalk apparently caused an orbital abscess with

metastatic cerebral abscess and purulent meningitis. It was peculiar that the cerebral abscess developed on the right side, while the left orbit was injured.

Parenchematous Keratitis.

Brejski, J. (*Inaug. Diss.*, Giessen, 1901.) 98 cases from July 1, 1895, to April, 1900. Hereditary syphilis in ten all of which showed several symptoms; probable in seven, syphilis of the father was admitted in two, acquired syphilis in three, suspicion of syphilis two, all together syphilis in 22 per cent. Tuberculosis in ten cases, rheumatism and gout in two, rickets one, influenza one, mumps one, diphtheria one, puerperium one, injury eleven, probable in two. The etiology was not clear in 33 cases. Hutchinson's teeth in seven, poor teeth in three, rhinitis in four, ear affections in four, swelling of the joints in four, rhagades in three, gummata in two, dacriocystoblennorrhoea in two, saddle-nose in one, swollen glands in fourteen cases. Almost always the uveal tract was affected; Hyperaemia of iris, iridocyclitis with synechiae and deposits on Descemet's membrane, twice with hypopyon, affections of the choroid in ten. In one case B. found an anterior synechia as first described by Schweigger and observed by Breuer in three cases. Keratitis punctata profunda (Mauthner) in three, central annular parenchymatous keratitis (Vossius) in fourteen patients. Relapses were observed eighteen times. Vesicles on the cornea in three cases, filamentous keratitis in one.

Myopia Operations.

Dr. M. Meyerhof. (*Archiv. für Augenheilk.* XLIV. 2.) Meyerhof reports thirty cases in which the operation suggested by Fukala was performed. The age of the patients ranged from nine to thirty-eight years and most of them belonged to the working class. The refraction before the operation ranged from — IOD. to — 28 D. and the vision from 2/3 to 2/35ths, and in one case the vision was limited to counting fingers in 1/4 m. Independently of three cases of retinal detachment the results of the operations were as follows. Slight improvement was obtained in four cases where before the operation the vision ranged from 1/240 to 1/10th, the vision in these cases going up to a

point between 1/17th and 1/7th. In the remaining cases the visual results were much better and all of the patients expressed themselves as much gratified with the operation. Many of the patients have been under observation for a considerable time, some for five years and no backward steps have been noticed with two exceptions, in which there was a history of traumatism. The author regards the existence of 15 dioptres of myopia a sufficient reason for operating and he never operates under 13 dioptres.

Subconjunctival Injections of Hetol.

PROF. PFLUGER. (*Klinish. Monatbl. für Augenheilk.*, September-Oktober, 1901.) The author is a firm believer in the value of subconjunctival injections of iodine and chloride of sodium and employs regularly such injections in progressive myopia, chronic choriditis, and in vitreous opacities. The investigations of Landerer with intravenous and intramuscular injections of hetol led Pfluger to try the agent in some of the more chronic intraocular affections. He has used the injections especially in herpes corneae of which we have keratitis dendritica as a conspicuous example, also in deep ulcer of the cornea and in various forms of uveitis. He has also tried the agent in parenchymatous keratitis and in relapsing scleritis. The injection of hetol to use his own words "exceeded all expectations." He injects every two days 0.0—0.5 C.-cg. of a. 1 per cent. hetol solution.

The Healing Process in Corneal Wounds with Especial Reference to the Action upon them of Cocain.

DR. MASUGI, Japan. (*Klinish. Monatbl. für Augenheilk.* August, September, Oktober, 1901.) Masugi's work is a most exhaustive one and his conclusions are practically these: Muriate of cocain brings about changes in the cells of the corneal epithelium and disturbs karyokinesis by extracting water from the cell substance and maybe, too, by its special toxic effect, and on this account there is a retardation of the healing process in the course of the wound.

Anatomical and Bacteriological Findings in a Case of Sympathetic Ophthalmia.

DR. GRUNERT. (*Klinische Monatbl. für Augenheilk.* November, 1901.) I need not go into the details of the findings but may state that this is the second contribution of this

character by Grunert, and just as in the first case his findings fail to confirm the results which were obtained by Deutschmann. Bacteriological and anatomical examinations in sympathetic ophthalmia are increasing every year, yet we must confess we are apparently as far as ever from a correct knowledge of the pathogenesis of this disease.

The Medical Treatment of Glaucoma.

Prof. Wicherkiewicz. (*Klinische Monatbl. für Augenheilk.*, Juli, 1901.) The author, while recognizing in certain cases the great value of iridectomy, makes a plea for eserine and pilocarpine in cases of chronic glaucoma. He orders a solution containing eserine 0.01, pilocarpine mur. 0.2, cocain mur. 0.1, aq. dest. 10.0. This solution is dropped in regularly every night and in the daytime only when there are acute exacerbations. He reports a case where the patient was kept for years on this solution with good result and where before, the simple use of eserine had produced no apparent effect upon the glaucomatous condition. He looks upon it as a sovereign remedy for glaucoma simplex.

Pathogenesis of Traumatic Enophthalmos.

Dr. Rudolph Lederer. (*Archiv. für Ophthalmologie*, LIII Band, 2. Heft.) The author reports two new cases of traumatic enophthalmos and then proceeds to analyze the cases which are met with in literature, fifty-two in all. He discusses the various theories which have been advanced to explain this singular affection and all of them he pronounces inadequate. According to his views the injury leads to either a direct or an indirect fracture of the orbital walls. There follows hemorrhage into the orbital tissue with a certain amount of tearing of the latter and subsequent cicatricial contraction which in itself is responsible for the retraction of the eyeball. The various symptoms which accompany traumatic enophthalmos are to be attributed then to direct injury, of the orbital structures through hemorrhage, possible from bony fragments may be to participation on the part of the orbital walls and of the neighboring structures. He shows conclusively that we have fracture of the orbital walls and hemorrhage into the orbital tissue.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas City, Mo.)

Dr. Siedler-Huguenin has established himself at Zurich.

The well known oculist, Dr. Noering of Lubeck, is dead.

Dr. Von Hjört will succeed Professor Schiötz at Christiana.

Professor Extraordinary Knies has given up his professorial work.

Dr. A. O. Griffin has returned from a visit to the hospitals in the East.

Dr. Henry W. Ring, of New Haven, has removed his office to 187 Church street.

Dr. A. G. Agababow has received the professorship of ophthalmology at Kasan.

Dr. E. Nesnamow of Charkow has been appointed professor of ophthalmology at Warsaw.

Professor Wilibald Nagel has been offered a position in the Physiological Institute at Berlin.

Dr. G. A. Fleming has been appointed demonstrator of ophthalmology in the University of Maryland.

Professor Sattler of Leipsic celebrated his twenty-fifth anniversary in practice on the 25th of October.

We regret to announce the death of Dr. Garcia Calderon of Madrid, a well known oculist and author.

The Berlin Gesellschaft für innere Medicine will hereafter admit to membership female doctors of medicine.

Dr. Chas. Zimmermann of Milwaukee and associate editor of these ANNALS has returned from a tour of the European clinics.

Dr. Geo. E. de Schweinitz of Philadelphia has been elected to the chair as Professor of Ophthalmology in the University of Pennsylvania.

Dr. Frank L. Henderson of St. Louis sailed for Europe December 31, 1901. He will spend the winter in the eye clinics of London, Paris, Berlin and Vienna.

Dr. A. A. Hubbell of Buffalo read a paper at the New York State Medical Association (Oct. 21-24) on the "Present Status of the Pathogenesis of Concomitant Strabismus."

We would announce the publication of Clinical Lectures on the Diseases of the Eye, by Dr. J. Elliott Colburn, professor of ophthalmology in the Chicago Polyclinic (see review in this number).

A verdict of $3,300 for the loss of sight in one eye was held by the appellate court of Indiana, in the case of Famous Manufacturing company vs. Harmon (62 N. E. Rep.. 306), not to be excessive.

By the will of Alfred H. Hersey of Hingham, Mass., the Massachusetts General Hospital, and the Perkins Institute for the Blind, each are given $5,000, and the Massachusetts Eye and Ear Infirmary $3,000.

Drs. F. W. Marlow, of Syracuse, N. Y., James Moores Ball, of St. Louis, Mo., Clarence van Epps of Farnhurst, Del., and Walter F. Macklin of New York City, have joined the staff of these ANNALS.

Dr. Arthur König, who was professor of physiological optics and director of the Physiological Institute at the University of Berlin, is dead. He was for a considerable period an assistant of Von Helmholtz. He was 46 years of age.

Dr. Charles H. May of New York has been ill for several months as the result of an infected wound of the finger received during surgical operation. His many friends may now congratulate him, as he is now convalescent and again at work.

Cancer Investigation.—The city of Frankfurt, Germany, has been presented with a fund of 500,000 marks for an endowment for research in regard to the etiology of carcinoma. The work has been entrusted to Ehrlich and Wiedenreich.—American Medicine.

Dr. A. Barkan of San Francisco, Cal., who, for several years, has been an associate editor to the ANNALS OF OPHTHALMOLOGY, has resigned. The thanks of the staff, the publisher and readers of the ANNALS are extended to him for his painstaking and efficient work.

Knighthood Conferred.—Sir George Anderson Critchett F. R. C. S. Ed., Surgeon-Oculist to His Majesty and Senior Ophthalmic Surgeon to St. Mary's Hospital, has recently had the honor of knighthood conferred upon him. Sir George Critchett has long held a preeminent position in ophthalmic surgery.—American Medicine.

The numerous cases of amaurosis reported from methyl alcohol make it incumbent on the medical profession generally to point out to the lay public the dangers in the use of this form of alcohol. Not only is there danger to sight but several deaths have occurred

from it. Attention should be directed by the whole medical profession to this terrible poison, and its use carefully restricted. Würdemann, Casey Wood, De Schweinitz and others have reported cases of blindness from it.

Fiftieth Anniversary of the Ophthalmoscope.—On November 13, 1851, Helmholtz first demonstrated the ophthalmoscope before the Königsberg Medical Society. The fiftieth anniversary of the invention of the ophthalmoscope was celebrated in Berlin, November 13, 1901, under the leadership of Prof. Greeff. 120 ophthalmoscopes were exhibited in historical order, among them instruments from various countries. The meeting of the Charité Hospital Society, held the next day, was devoted to ophthalmoscopy.—Philadelphia Medical Journal.

Dr. James Moores Ball, of St. Louis, who has been engaged for several years in writing a text-book of ophthalmology, announces the early publication of the work. It will be issued by a well known Philadelphia publishing house and will be entitled "Modern Ophthalmology." It is said that the colored illustrations of the fundus, the handiwork of Miss Margaretta Washington, are of unusual merit. The chapters on anomalies of the muscles, orbital diseases, and errors of refraction, have been written respectively by Drs. Wm. Zentmayer, Wm. T. Shoemaker and John T. Krail, of Philadelphia.

"Visual Economics," this is the title of a new work which has been jointly prepared by Prof. Magnus of Breslau, Germany, and Dr. Würdemann of these ANNALS, dealing with the effects of accident to the eyes upon the working capacity of the individual. It gives rules for estimation of economic damage and is adapted to the forms of American law, so that it may be readily used not only for the calculation of the damage to the individual but as a work of reference and a reliable authority upon the medico-legal results of such accidents.

An Eye Explosion.—A rather amusing incident is related by a patient at Wheeling, W. Va., who was fitted with one of the new Snellen or full back artificial eyes. He was unusually well pleased with the natural appearance and the comfortable feeling of his new eye, and all went well until one night when he returned from his daily vocation on the W. & L. E. train, he entered a billiard parlor and met a throng of his friends, suddenly everyone was startled by a report as if from a gun. The man was very much frightened but soon realized that his eye exploded and rushed out of the door, his friends breathlessly looked at each other and for a moment each was afraid to murmur or move for fear some one was shot.—The Optical Journal.

Cured by Prayer (?).—In recent newspaper accounts a very reverend

pastor ascribes the cure of his blindness entirely to the results of prayer to the Almighty. The fact is that he was successfully operated upon by a New York oculist who not only does not get credit for his skill but possibly received little or no fee for his work, and according to the public press does not even get thanks. This reminds me of an "Unchristian scientist" who came to me complaining of deafness which was speedily relieved by washing out hardened wax with which the auditory canal was filled. A few weeks later I heard of a wonderful cure of deafness by "Christian Science" made in this same case, the date concurring with the time of her consultation with me. (H. V. W.)

Jonathan Hutchison, F. R. S., General Secretary of the New Sydenham Society, has requested Messrs. P. Blackiston's Son & Co., of Philadelphia, the American agents of the Society, to announce the publication of "An Atlas of Clinical Medicine, Surgery and Pathology," selected and arranged with the design to afford, in as complete a manner as possible, aids to diagnosis in all departments of practice. It is proposed to complete the work in five years, in fasciculi form, eight to ten plates issued every three months in connection with the regular publications of the Society. The New Sydenham Society was established in 1858, with the object of publishing essays, monographs and translations of work which could not be otherwise issued. The list of publications numbers upward of 170 volumes of the greatest scientific value. An effort is now being made to increase the membership, in order to extend its work.

Charles H. Burnett, M. D., University of Pennsylvania, 1867, died at his home in Bryn Mawr, near Philadelphia, January 31, aged 60. After his graduation he served one year as interne in the Episcopal Hospital and then studied abroad for two years, devoting his attention especially to otology. On his return he commenced to practice in Philadelphia, making a specialty of diseases of the ear, and in this department soon took a leading position. His contributions to otologic literature have been numerous and valuable, chief among them are "A System of Diseases of the Ear, Nose and Throat," "Diseases and Injuries of the Ear," and "On the Ear." He was a member of the American Otological Association, the Philadelphia College of Physicians, Philadelphia County Medical Society and of the Philadelphia Pathological Society. He was founder of the Philadelphia Infirmary for Diseases of the Ear, of which he was also chief of the staff, and was also aurist to the Presbyterian Hospital.—Jour. A. M. A.

Positive Signs of Locomotor Ataxia.—Fournier gives six signs which should be sought when there is reason to suspect tabes. The first is Westphal's sign, the absence of the patellar reflex, found in two-thirds of all cases in the early stages. Next is Romberg's sign, unsteadiness of the body when standing erect with the eyes closed. Third is the difficulty experienced in walking down stairs.

Fourth, while sitting and attempting to place one leg across the other, an undue effort is observed, a swinging, circular movement of the leg. The fifth test consists in noting the promptnes and decision in halting at command and turning about while walking. The movements in the early ataxic condition are performed with unsteadiness and uncertainty. The sixth test consists in requiring the patient to stand on one foot, first with the eyes open and then with them closed, and noting the muscular instability. This test is regarded as the most impoatant of all.—Philadelphia Medical Journal.

Employment of Suprarenal Extract by the Oculist.—L. Thilliez has met with the happiest results in his use of suprarenal extract in ocular affections. The solution he uses is composed of equal parts of distilled water and the dried suprarenal powder, which is carefully sterilized and preserved in glass receptacles holding 1 gr. It is a brownish liquid, which is preserved indefinitely as long as the tube is closed. The results are constant. The profound anæmia which is induced in the conjunctiva by its use lasts for one or two hours, according to the individual and the quantity used. Its vasoconstrictor action is especially marked on the conjunctival vessels, but is also seen in the sub-conjunctival or episcleral vessels, and to a slight degree in the deep vessels. The use of this drug is most valuable in intense conjunctival injection. It is useful in cases of keratitis and iritis with injection. Its use has been followed by excellent results in the treatment of glaucoma—Journal des Sciences Medicales de Lille, September 14, 1901.—New York Med. Record.

Editor Optical Journal:—In regard to your article, p. 57, Jan. No., "Why Not 'Doctor'?" Simply because of ninety-five out of every hundred people the word "doctor" very properly carries the significance of physician, doctor of medicine, who is, however, lothsome of us opticians are to recognize and admit the fact, a college man with long special training and study to get his degree, diploma and right to the title, which many opticians are only too anxious to appropriate and "trade" upon.

The word trade is used advisedly for legitimately we opticians are tradesmen and not professional men.

The traveling fakir is the man who always calls himself "doctor" and the least creditable of office opticians are most jealous of the stolen title.

Until laws are enacted, and enforced, preventing this, the optical trade will be, as now, to largely fraud and "bluff."

I for one would like to be a doctor but simple honesty prevents one from claiming to be what he certainly is not. Yours very truly, Fred. R. Foster.—Optical Journal.

New Devices for Training the Blind.—The Paris Academy of Medicine has just been shown an invention by Dr. Dussard that completely revolutionizes the system of writing, calculation, and musical notation for the blind. The system marks a decided im-

provement on the Braille method, and is hardly less important than the improvement made by Braille himself. The primary advantage is that the blind are enabled to read and immediately correct what they have written. It does away with the cumbersome calculating board, and all of the apparatus necessary to the blind student may be folded and carried in the pocket. Dr. Dussard's appliance consists of a frame on which runs a ruler containing sets of square spaces, disclosing small dice fixed on a flexible metal band beneath. When the writing point is pressed on one of the concave spots of the dice, a raised spot appears in the paper. The position of the dots being mechanically determined, perfect regularity in the characters is obtained. The writer has but to lift the ruler which is hinged and cannot be displaced, to read by the touch the characters which he has just formed. Erasures are accordingly made at once. Arithmetical notation on paper is thus rendered easy. The invention was brought before the Academy of Medicine December 2d, by Dr. Laborde, and two girls from the Braille School showed how easy it was to make use of the machine. Their speed in writing was equal to that of the average writer using pen and ink.—Philadelphia Medical Journal.

A Review of Some Recent Literature on the Etiology of Carcinoma.—Aloysius O. J. Kelly calls attention to the fact that has been pointed out by Sailer that Schaudinn, one of the keenest zoologists, has lately stated that he has carefully examined sections of one hundred malignant growths in which the so-called parasites were present, and he is convinced that the growths did not contain any bodies that could be regarded as coccidia or protozoa. The writer is not willing to deny that malignant tumors may be due to the pathogenic activities of lower forms of life, still he believes that the proposition has not yet been proved, and that there are many facts known that speak against the likelihood of its ever being proved, at least with the present method of investigation. He concludes by quoting Ziegler's opinion: "The formations have been described as protozoa and blastomycetes are in reality degenerated nuclei, degenerated nucleolar figures, various products of the cell protoplasm, such as mucus, colloid, hyalin, keratohyalin, or cells; for instance, cancer cells that have included leucocytes or the products of their retrograde metaphorphoses. The supporters of the parasitic theory of tumors are in reality decreasing in number, and this phenomenon is justified not only on account of the want of the demonstration of the occurrence of tumor parasites, but also because all the biological characteristics of tumors speak against their parasitic nature."—University of Pennsylvania Medical Bulletin.—New York Med. Record.

A meeting of the Chicago Ophthalmological and Otological Society, Pres. Wm. H. Wilder in the Chair, Brown Pusey, Secretary was held in Chicago, Feb. 11, 1902. The following papers were read:

"Three Unusual Operations,"—Dr. Hale; "Some Observations

on the Efficacy and Irritating Properties of Nargol,"—Dr. Schwartz; "Charts and Models to Illustrate Mauthner's Method of Diagnosing Muscle Paralysis,"—Dr. Snydaker.

The following were elected to membership in the Society:

C. R. Elwood, Menominee, Mich.; H. T. Hornbogen, Marquette, Mich.; H. F. Holmes, Minneapolis, Minn.; E. Boeckmann, St. Paul, Minn.; F. C. Todd, Minneapolis, Minn.; L. R. Ryan, Galesburg, Ill.; E. V. Appleby, St. Paul, Minn.: C. Williams, St. Paul, Minn.

An important amendment to the bylaws proposed by Dr. Würdemann was adopted:

Hereafter applications for membership in the Chicago Ophthalmological and Otological Society must be accompanied by an original thesis in writing not hitherto read or published upon some eye, ear, nose or throat subject, which is to be submitted to the Membership Committee and approved, and then read and defended by the author in open meeting; the election is to be held at the next regular meeting of the Society.

Dynamite Causes Havoc to the Manhattan Eye and Ear Hospital. —An accidental fire in a small powder house in which was stored a quantity of dynamite for use in the subway tunnel, caused a very severe explosion at Park avenue and Forty-first street. The Manhattan Eye and Ear Hospital, which was close by the spot where the explosion occurred, was badly shaken and damaged, so that several days will be required to put it in repair. There were 63 patients in the hospital, and most of them, together with the nurses and physicians, were more or less injuried by the flying glass. Dr. T. Passmore Berens was hurt, and among the patients was a boy who was convalescing from an operation for abscess of the brain. No one of the many in the building at the time was seriously hurt, but the entire front of the building was wrecked and nearly every room made untenantable. About 60 windows were broken in the Hospital for Ruptured and Crippled, situated two or three blocks distant from the explosion, and the children were thrown into a panic. While six surgeons, in an ambulance from the Roosevelt Hospital, were hurrying to the scene, the ambulance collided with a delivery wagon. One surgeon and a driver were thrown into the street, and an axle of the ambulance was broken. Finding the ambulance disabled, the surgeons seized the stretcher and ran on. The contractors engaged in constructing the section of the subway tunnel on Washington Heights have been hurrying along the work by using heavy blasts. One of these was so severe that it shook the building of the Hebrew Sheltering Guardian Society Orphan Asylum, causing plaster to fall from the ceiling in nearly every room, and pictures and ornaments to tumble from the shelves. The children ran through the corridors screaming with fright, and the superintendent was not able to get any satisfaction either from the contractors or the police. The old question of abolishing the coroner's office received a new impetus by the spectacle which Coroner

Goldenkranz made in connection with the dynamite disaster in the tunnel. Although he talked loudly about being "a constitutional officer," it should not be forgotten that this office was expressly stricken from the revised constitution in 1894 in order to make it easy for the legislature to abolish it. It is difficult to say why this has not yet been done, especially when the good example set by Massachusetts has been so long before us, but the time seems ripe for such action by the legislature.—Jour. A. M. A.

William Fisher Norris, '57 C., '61 M. Late Professor of Ophthalmology and Clinical Professor of Diseases of the Eye in the Department of Medicine.—Dr. William F. Norris' family originally came from the Isle of Wight. One of the earliest mentioned ancestors was Thomas Norris—a merchant and a Friend, who lived in London in 1650. Persecuted on account of his religious beliefs, he emigrated to the Island of Jamaica, where forty-two years later, he and his family, with the exception of one son, Isaac, perished in the earthquake that destroyed Port Royal. This son coming to Philadelphia and marrying a daughter of Thomas Lloyd had a succession of descendants through the Parker's, the Fox's and the Fisher's, until 1839, when on the sixth day of January of that year, William Fisher Norris, the subject of this sketch was born in that city; his father being Dr. George W. Norris and his mother, Mary P. (Fisher) Norris.

After a careful preparatory training, he entered the Academic Department of the University of Pennsylvania and took the degree of Bachelor of Arts in 1857, receiving the Master's degree three years after. In 1861, he graduated from the Department of Medicine of the University, the subject of his inaugural thesis being "Generation and Development."

The following year he was appointed one of the Resident Physicians to the Pennsylvania hospital, uninterruptedly serving that institution in that capacity for a full term of eighteen months.

In 1863, he became an Assistant Surgeon in the United States Army, serving as one of the Assistants under Dr. William Thomson in charge of the Douglass General Hospital in Washington. During this and the next year, when he was chosen to take charge of the hospital—Dr. Thomson having been advanced to the position of Medical Inspector of all hospitals in the Department of Washington—he with his colleague, commenced to make a series of studies in photography. This period of his life, during which he and Dr. Thomson engaged themselves in such work as the preparation of the initial steps toward the photographic preservation of the appearances of important medical and surgical cases, as may be seen in volumes of the "Medical and Surgical History of the War of Rebellion," and devoted much of their leisure to the more important primary successful studies in the wet plate process of microphotography, was the time that laid the foundation for his after success in the ophthalmic world.

Upon his return to civilian life, he, in the pursuit of additional

medical knowledge, soon found his way to the many capitols of Europe. Naturally, his earlier studies in applied optics gave him the necessary impulse to visit the clinics of the greatest ophthalmic teachers of the time—von Arlt, von Jaeger, and Mauthner—and to receive from them the careful practical instruction that later always showed itself in his accurate and painstaking work.

Returning to his native city, he continued to pursue his studies in his chosen specialty at the clinics of Wills' Hospital.

Fully equipped, he in 1870, in association with Dr. George Strawbridge, was made a Lecturer on Diseases of the Eye and Ear in the Department of Medicine of the University of Pennsylvania—this constituted the first real work at the University. The same year, as the result of a marked impetus given for the better position and recognition of ophthalmic surgery, he. with his friends, Ezra Dyer, Strawbridge, and Thomson, were added to the Attending Staff of Wills' Hospital, thus opening a new decade in American ophthalmology.

At about this time, the first permanent influences of Dr. S. Weir Mitchell's comprehensive studies and definite conclusions upon the effects of eyestrain upon the general system became so widely known, that with Thomson actually teaching ophthalmology at the Jefferson Medical College, and Norris with Strawbridge giving their knowledge upon it at the University, it became necessary in 1873, to make the subject one of special study for the student body at the University, with Dr Norris elevated to the post of Clinical Professor of Diseases of Eye, and Dr. Strawbridge made Clinical Professor of Diseases of the Ear.

Ever striving for broader recognition of his branch, persistently at work for its betterment, and constantly endeavoring to strengthen its influences, he was continually striving for those who were brought in touch with him. As a result, he was successively offered and given the chair of Honorary Professor of Ophthalmology and Prof. of ophthalmology in the Medical Department of his alma mater.

In 1871, he, in association with Dr. Horatio C. Wood and Dr. William Pepper, conceived the idea of a hospital to be used in connection with the Department of Medicine. In three years' time, with the help of the alumni rallied under the chairmanship of the Hon. Morton McMichael, the personal solicitations of Dr. Pepper (the chairman of the Commission), and the individual work of its projectors and their friends, the hospital opened its doors for the reception of patients; one of the most remarkable accomplishments of time. He, occupying various positions upon its staff and board of managers, gradually rose to the presidency of its management.

His membership list in the various societies though not extensive, shows his tastes and his inclinations. Made a Fellow of the College of Physicians of Philadelphia in 1866, and a member of the Academy of Natural Sciences two years later, he is found as early as 1870, efficiently serving a secretaryship in the briefly active though still existing Ophthalmological Society of Philadelphia. In the same

year is recorded his admission to membership in the American Ophthalmological Society. In 1882, he was elected to companionship in the Military Order of the Loyal Legion. For quite a number of years past, he was connected with the Board of Directors of the Mutual Assurance Company for Insuring Homes from Loss by Fire (the Old Green Tree Mutual Assurance Company). In 1877, he acted as Vice-President of the Pathological Society of Philadelphia. During the years 1885 to 1889 he was honored with the Presidency of the American Ophthalmological Society. From 1894 to 1897 he served as Chairman of the Section on Ophthalmology of the College of Physicians of Philadelphia. In October of the present year, he, in association with his colleague, Dr. George C. Harlan, was given the newly created position of Consulting Surgeon to the Wills' Hospital: "As a token of respect for his many years of unremitting labor as Attending Surgeon."

His extended writings, independent of many minor journal articles with such men as Edward O. Shakespeare and James Wallace, society reports, and experimental studies, as that with Stricker on the corpuscular elements of the cornea, were voluminous. Beginning with his contribution to Dr. James Tyson's well known monograph on "Bright's Disease" and the chapter on the eye in the Surgery of John Ashhurst, he, in 1885 and 1886, prepared a most important article on "Medical Ophthalmology" for Pepper's System of Medicine. Six years later, a "Text-Book of Ophthalmology," written in conjunction with Dr. Charles A. Oliver, appeared, followed in four years' time by the first of four volumes of a "System of Diseases of the Eye," which with the co-editorship of Dr. Oliver, consumed six years of almost constant combined labor for completion; truly a monumental work, and one that has not its equal in English speaking ophthalmology.

Dr. Norris was twice married. His first wife was Rosa Clara Buchmann, of Vienna. His second, who was Annetta Culp Earnshaw, of Gettysburg, Pa., survived him. He left two sons, both by his first wife; one Dr. George William Norris, who is one of the Resident Physicians at the Pennsylvania Hospital, and the other, William Felix Norris, who is a student in the Department of Law at the University.

After a few weeks' illness from a series of recurrent attacks of double pneumonia, which was complicated by a diabetes of several years' standing, he died, surrounded by his immediate family, at 1 a. m., on the eighteenth of November, 1901.

Possessed of independent means, private emolument did not appeal to him; in fact, pecuniary returns were never proportionate to his services. He was shy, modest, and unassuming in his deportment before strangers and large audiences, ofttimes giving the unwarranted appearance of brusqueness or diffidence. His personality was striking and commanding. Tall, quite bald, fair complexioned with an inclination to pallor, and bluish gray eyes, gave him, with his almost fully whitened beard, an appearance of age that was far in excess of his actual years. His countinance was of intellectual type, with much dignity of expression, "breaking upon

occasion," as William Hunt said in the memoir of his father, "into a smile of extraordinary sweetness."

His voice, like that of his father, "was low, but well modulated, and the respect and attention which his appearance always commanded, made it also easy to hear him" (Hunt). As an operator he was slow and precise, every detail of action and safeguard against accident being fully considered and provided for. In his selection of appropriate cases for operative procedure, the greatest consideration was that for the good of the patient; not an iota for undue impression or self-praise was for a moment considered.

Gentle of nature and kindness itself in disposition in his home life, his own true self could only be appreciated by those who were drawn the closest to him.

Firmness, will-power, and great mental restraint marked him in his public life. Courteous and dignified in all of his actions and the fortunate possessor of rare good judgment and common sense, made him constantly sought for by those who needed fair and impartial advice upon questions of the greatest importance and delicacy of handling.

Personal ambition and increased power never exercised any control over his actions. His life was a subjugation of the man for the right. He worked indefatigably for one purpose—the good of ophthalmology and his alma mater. CHARLES A. OLIVER, '76 M.—University of Pennsylvania Alumni Register.

Double Vision.—An "illusion" which appeared to Abraham Lincoln has never been explained upon rational grounds, so far as my observations go. President Lincoln is reported to have said:

"It was just after my election in 1860, when the news had been coming in thick and fast all day, and there had been a great 'hurrah boys!' so that I was well tired out and went home to rest, throwing myself upon a lounge in my chamber. Opposite to where I lay, was a bureau with a swinging glass upon it; and looking into that glass, I saw myself reflected nearly at full length: but my face, I noticed, had two separate and distinct images, the tip of the nose of one being about three inches from the tip of the other. I was a little bothered, perhaps startled, and got up and looked into the glass, but the illusion vanished. On lying down again, I saw it a second time, plainer if possible, than before, and then I noticed that one of the faces was a little paler—say five shades—than the other. I got up and the thing melted away, and I went off, and in the excitement of the hour forgot all about it—nearly, but not quite, for the thing would once in a while come up, and give me a little pang as though something uncomfortable had happened. When I went home, I told my wife about it, and a few days after I tried the experiment again; when sure enough the thing came back again, but I never succeeded in bringing the ghost back after that, though I once tried very industriously to show it to my wife, who was worried about it somewhat. She thought it was 'a sign' that I was to be elected to a second term of

office, and that the paleness of one of the faces was an omen that I should not see life through the last term."

Now, this "illusion" like others that haunt people, as this did Abraham Lincoln, can be explained upon rational grounds when all the facts are known and rightly interpreted.

As he lay there upon the couch, every muscle became relaxed, as never before. In this relaxed condition, in a pensive mood, and in an effort to recuperate the energies of a weried mind, his eyes fell upon the mirror in which he could see himself at full length reclining upon the couch. All the muscles that direct, control, and keep the two eyes together, were relaxed; the eyes were allowed to separate, and each eye saw a separate and distinct image by itself. The relaxation was so complete for the time being that the eyes were not brought together as is usual by the action of the converging muscles; hence the counterpart presentment of himself. He would have seen two images of everything else had he looked for them, but he was so startled by the ghostly appearance that he felt a "little pang as though something uncomfortable had happened," and obtained but little rest. What a solace to his wearied mind it it would have been, if some one could have explained this "illusion" upon rational grounds.

This was a temporary condition due to the fatigue from the intense work and excitement which had been going on from the time of his nomination until after his election as President of the United States.

There are conditions, however, which are born with the eyes, that may be developed enough by overusing them to produce headaches, and other manifestations of disorders of the nervous system, which may be accompanied with double vision. By the advancements in modern ophthalmology, a large number of these cases can be relieved which were formerly considered to be incurable.—Dr. E. E. Holt, in Journal of Medicine and Science.

Restoration of Sight—Born Blind, but Vision Acquired at Forty Years of Age.—"Blindness is not such a bad thing when a fellow gets used to it," said a New Orleans oculist, and, after all, in cases where a man is born blind there are certain compensating effects which seem to offset, to some extent, at least, the affliction of living in utter darkness. Sam Jones is the author of a rather homely story to the effect that a man who lost his right foot in an accident consoled himself with the reflection that it was the foot that had the corns on it. The law of compensation is a great and consoling factor in life, and Emerson's splendid tribute to the principle did not reach too high. But, speaking of blindness, I recall a rather remarkable case which came under the observation of a Tennessee oculist, now living in Memphis. It was the case of a Mississippian. He was born blind. He was 40 years old when the attention of the specialist was first called to his case. He had cataracts on his eyes, and had never seen the light of day, and in fact, had lived in utter darkness during

the forty years of his life. The specialist found the case of such absorbing interest that he made a close study of it, and reported it to the national association, of which he was a member. as one of the most remarkable cases in the history of the profession. The remarkable features of the case were found in the case with which the blind man had moved about in the world, in his ability to reason accurately about distance and direction, and in the fact that he had been able to make a living for himself and family, and had acquired a small competency. He was a farmer. He had bought and paid for the farm. He was able to do any kind of agricultural work, except use the hoe and plow cotton in the early stages of its growth. He was able to leave his home without a guide and go to the home of his neighbor on a social or business mission, and he often called his dogs around him at night with the hunter's horn, and would plunge into the very heart of the forest on a coon hunt or a fox chase, and he never experienced any troubles in getting back home, either. While he could not tell where the moss was on the tree, he knew intuitively north from south, and always got home, even when he would make the trip by himself. The fact is that he experienced absolutely no trouble in ordinary affairs of life, and was looked upon by his neighbors and friends as a good and useful member of society in every respect. He had wooed, won, and married a young Mississippi girl, and had reared an interesting family of children.

"But the most interesting part of the story," the narrator continued, "from the way I look at the case, was in the experiments made after the blind man came under his observation. These experiments had particular reference to the man's method of reasoning. He concluded that he would have his eyes operated on, and he sought the specialist for that purpose. Just before going to the operating-room he weakened. 'I believe I'd rather not see anything,' he said appealingly to the specialist, and when pressed for the reason he explained that he was married, that he loved his wife, and believed her the prettiest and sweetest thing in the world, and that he had drawn a mental picture of her, and he was fearful that really seeing her might in some way mar the picture. At any rate the specialist persuaded him to undergo the operation. The sudden change which followed was marvelous. Square blocks, things in circular form, glass tumblers, and things of that sort were held up before him after the operation. When the specialist would ask him to name certain articles he would reach for it from force of habit, but, of course, the physician would not let him touch it. He was able, after some hesitation, to tell the shapes and names of things which he had only known through the sense of touch. Even the more pronounced colors, which he had been able to distinguish through the sense of touch, he was able to name when his eyes fell on them for the first time. The cot in the hospital, upon which he had lain and which he found without difficulty in a room containing a hundred or more before the operation, he was able to find after the specialist had removed the cataract from his eyes. The only thing he failed to recognize was a poodle

dog which was covered with long white hair, and with evident curiosity he asked his benefactor what kind of an animal it was. He had been used to hounds, and a dog which did not have long ears, short hair, and long slim legs was something he had never known while he was seeing things with his hand. He was cured, and returned to his family in Mississippi. He wrote to the specialist as soon as he reached home. He recalled the conversation he had with the doctor respecting his wife, just before he went to the operating table. He said he knew the physician was anxious to know what he thought of his wife since he could see her as she really was, and added that she was really prettier than he had ever thought she was in the days of his blindness, and the vision had amply repaid him for all the pain and expense to which he had been put while under the specialist's treatment."—New Orleans Times-Democrat.

Massage by the Blind—Have Peculiar Capacity, and in the Orient Have a Monopoly.—Among the many things—philosophical, scientific, and social—for which Western civilization is indebted to the far East, few are more characteristic of the Orient, especially of Japan, and at the same time easily capable of world-wide utility, than massage.

How long the practice of massaging the body has been customary in Japan is, of course, difficult to ascertain, but there is every reason to suppose that it first originated in that country, and so much is certain that nowhere else in the world is it so generally recognized as an easy means of alleviating physical exhaustion, discomfort, or pain.

A matter which frequently arouses the comment of strangers visiting the "England of the East" is, that those who are professionally engaged in this practice have lost or never possessed the sense of sight. It is quite a familiar sight, not only in cities, but also in villages, to see a blind masseur waiting about and calling out that he is ready to perform massage, and a little inquiry by the interested foreigner will elicit the fact that the blind enjoy practically a monopoly of this hygienic and remedial industry—a privilege which, it would appear, was granted to them by a former Emperor, several centuries ago. This custom is in itself sufficient to show that the masseurs are employed by all classes. The wealthy regularly submit themselves to the operation after their daily bath, and many of the working people, their day's work completed, have the soreness taken from their limbs in this manner. The cost is but a trifle, as may be judged from the fact that the European or American who pays the equivalent of sixpence is thought to be very generous, indeed. It was from Japan that massage found its way to Russin, where at first, among the better classes, it found much favor. And here also the blind—and they are very numerous, indeed, in Russia—have been specially selected for the work—not merely in order to find them an occupation by which they can earn a livelihood, but also because they are

peculiarly proficient. In the institute for the blind in St. Petersburg a considerable number of the inmates are carefully instructed in the best methods of performing a massage, and they are also given an elementary, but very serviceable, knowledge of some of the main points of anatomy and physiology. On the whole, these experiments have worked well in Russia, but such can scarcely be said to be the case in Germany.

Various attempts have been made in that country to employ the blind in comparatively large numbers as masseurs and masseuses, but the public have hitherto not shown much liking for the innovation, and consequently it has not proved to be a success. It is, however, pleasing to learn that there is every likelihood of a change for the better in the near future, for a new movement, supported by a great number of very influential men, has been taken up, and, so far as the present arrangements for the promotion of this plan are concerned, they seem to be highly satisfactory in every respect. In connection with this statement it is interesting to note that a Leipsic physician has recently published an instructive and valuable account of a series of cases in one of the leading scientific German papers from which it appears that blind operators have attained to a high state of proficiency. This proficiency is quite desirable, for a well-known physiological fact which the physician's observation has emphasized is, that when nature deprives a man of one sense it often partly compensates him with remarkable keenness in another; and so a blind masseur is often found to possess a quite wonderful delicacy of touch. Want of sight is, indeed, no disadvantage at all in a masseur, but on the contrary, for we must remember that many people would prefer this in an operator, and, further, the operator as such is but little aided by the operator's vision—it is a mere matter of tactile power.—Louis Elkind, M. D., in London Mail.

BOOK NOTICES.

Neurology of the Eye.

Wilbrand and Saenger, Hamburg, Die Neurologie des Auges, ein Handbuch f. Nerven und Augen-Aerzte. Vol. II, 324 pages with 49 figures in the text. Wiesbaden, J. F. Bergmann, 1901. Price, 8.60 M. $2.15.

The 2nd Vol. of this monumental handbook conveys to the reader the same impression we described in the ANNALS of January, 1901, in reviewing the 2nd part of Vol. I. It is a standard work of the highest order. Vol. II contains the relations of the nervous system to the lacrimal apparatus, conjunctiva and cornea, each chapter presenting in detail the anatomy, physiology and pathology. From their own observations and studies the authors reach the conclusion that the question as to the innervation of the lacrimal gland cannot be definitely answered. Some experiences and clinical facts are very much in favor of the 7th, others of the 5th or sympathetic nerves. Either great varieties occur in which the innervation must be attributed here to the facial, there to the 5th, and again to the sympathetic nerves, or two of them, or perhaps all three nerves act combined in each case. The anatomy and physiology of the 5th nerve are very exhaustively treated. According to the views of Michel and Koelliker the ciliary ganglion is considered as a sympathetic ganglion, the functions of which are governed by the 3rd nerve.

Under the organic lesions of the 5th nerve, with regard to the eye, the conditions of irritation, as observed in inflammations of the anterior segment of the globe, are considered under the following subdivisions: Vasomotor irritations, with a table of cases of neuralgia with post mortem changes, increased intraocular pressure, lacrimation, reflex spasm of orbicularis muscle, contraction of pupils, pain, photophobia, sympathetic irritation and inflammation. Then the anesthetic and hyperesthetic conditions (pages 102-138) and the trophic disturbances: Herpes zoster ophthalmicus (pages 138-205), localizations on the skin and different parts of the eye and complications, entering into the various theories as to its pathogenesis. Pages 206 to 300 are devoted to an exhaustive treatise on neuroparalytic keratitis and, on the last page, the relations of the 5th nerve to various diseases of the nervous system are dealt with. The literature is extensively quoted and enumerated in 859 numbers and many own observations of the authors reported, so that any one who wishes to study these topics will find in this work all that is known about them. C. ZIMMERMANN.

Test Types for Distance.

Dr. von Ammon, Muenchen Schriftproben-Tafeln zur Bestimmung der Schschaerfe fuer die Ferne. Six lithographic plates and explanatory text. Muenchen, 1901. J. F. Lehmann.

The first plate contains 75 letters in twelve rows according to Snellen's Test-types for distances from 60 to 3 meters, with modifications of some letters, e. g., the point of A has been broadened, so that it can not be easily guessed. Plate 2 is the picture of the first as seen in the mirror. Plate 3 and its mirror plate 4 are the same as the two former, only in diminished size as these would appear at distances from 56 to 2.4 meters. They chiefly serve for detection of simulation. If, e. g., a person sees No. 10 at 5 m. which means V = 5/10 and then, at a distance of 2 meters from the mirror, which is 6 meters distance from the test types, again No. 10 in the mirror, his distance from the picture will be 6 + 2 = 8 m. and his vision V = 8/10. If, at a second test with plates 3 and 4 (diminished in size), the patient sees the same line as on the first plate, without knowing the difference in size, his V. will be, e. g., 6/12 instead of 6/15 with the first plate. Since the hook tests generally show higher V than the letters, A. modified these also on plate 5. The square on plate 6 with hooks may be cut out, so that each hook may be shown separately, thus preventing simulation by comparison. 14 pages of text explain in detail the views and aims of the author which are very commendable. C. ZIMMERMANN.

International Test-Types for Children.

Dr. Heimann, Berlin, Internationale Schrift-Tafel für Kinder. Berlin, 1902, Fischer's Med. Buchhandlung, H. Koenfeld.M. 2. 50 cents.

The test objects consist in seven black pointing hands in different positions for distances from 60 to 5 meters, so that children need only to intimate the position of the hand they see, which simplyfies the test very much. They are also useful in testing the eyes of illiterates and deaf mutes. A short explanatory test in German, French, English and Russia accompanies the plate which is drawn on pastboard. C. ZIMMERMANN.

Microscopic Anatomy of the Eye.

F. Merkel and E. Kallius, Goettingen, Graefe-Saemisch, Handbuch der gesamtem Augenheilk., 2nd edition, newly written, with numerous illustrations. No. 31. Leipzig, 1901. W. Engelman. 3 M. 75 cents.

No. 31 terminates the chapter on the anatomy of the eye which we reviewed in the ANNALS of October, 1901, with the same thorough description of the ocular nerves and their varieties, including a special chapter on the varieties, of the ciliary ganglion and its communications. A portion of the new figures were taken from Merkel's handbook of topographic anatomy. The extensive bibliographies classified on 42 pages, showing the completeness of the great handbook also in this respect. C. ZIMMERMANN.

On Ocular Affections Due to Intoxications.

W. Uhthoff, Breslau. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde, 2nd edition, newly written, 182 pages, with eight plates and two figures in text. Nos. 32, 33, 34, Leipzig, 1901, W. Engelmann. Subscription 6 M. $1.50.

This is an excellent chapter of the great handbook of Graefe-Saemisch, entirely new, and written by an author whose investigations on alcohol and tobacco amblyopia, published in von Graefe's Archives, have become famous. It comprises only ectogeneous or autointoxications which are only alluded to at the end, as far as a comparison of the ocular disturbances from them with the former is of especial interest. A classification of the subject matter from a uniform principle not being possible, the author arranged it partly according to the clinical analogies of the visual affections, produced by the various poisons, partly to their chemical affinities, the similarity of their physiological action, partly to their common clinical importance, etc. The most prominence is given to those substances which are notably apt to create anatomical lesions of the optic nerve and retina directly or indirectly by alteration of the vascular system, and marked impairment of sight. They are practically the most important, the exact knowledge of which is absolutely necessary for the physician. Then the vast array of intoxications affecting the muscles of the eye, especially the intrinsic, those that cause chiefly subjective visual ailments without anatomical lesions, others which set up external inflammations, and others with decisive action on the contraction or dilatation of the bloodvessels, etc. U. demonstrates how much an exact analysis of the ocular symptoms, in anatomical and clinical respects, favors the knowledge of the general phenomena of intoxications, owing to the precision and multiformity of the ophthalmological methods of examination.

Among all poisons alcohol undoubtedly exerts most frequently a detrimental influence on the visual organ, i. e., almost exclusively ethyl alcohol and its adulterations, in rare exceptions methyl alcohol. The ocular disturbances from alcoholism in man are considered under the following headings: acute and chronic amblyopia, affections of the muscles, of the pupil, hemeralopia with and without xerosis of the conjunctiva, visual delusions and illusions. U. found in his several thousands of patients, suffering from abuse of alcohol and tobacco, 327 cases of amblyopia, 41 of which were caused by tobacco alone, 286 were equally caused by alcohol alone or chiefly, and by alcohol and tobacco combined. In Berlin and Marburg he scarcely saw one case of alcohol amblyopia in women, but in Breslau 10 per cent., which shows that the female sex is also seized when it is exposed to the same intoxications, as it occurs in Eastern Germany. His anatomical investigations on 11 cases, which were made before the new methods of Nissl, Golgi and Marchi were known, so that further examinations are desirable, confirmed the supposition that the pathogenesis of chronic alcoholism and intoxication by tobacco consists in a partial interstitial neuritis of the optic nerve with ascend-

ing and decending atrophy of the nerve fibres, partly atrophy of the muscular ganglia of the retina. With this view corresponds best the clinical appearance of the visual disturbances. As far reaching as the anologies between tobacco and alcohol amblyopia may be, as far as they diverge with regard to the complications with peripheral multiple neuritis which was hardly ever observed in nicotine intoxication but is relatively frequent in alcoholism. In severe alcoholism U. found changes of the optic nerve in 16 per cent., marked peripheral multiple neuritis 4 per cent. While each substance of which the intoxicating influence upon the visual organ has ever been observed receives due consideration, the visual alterations by quinine, lead, filix mas, mercury, naphthaline, the mydriatics, anesthetics, narcotics, toxins and the intoxications, in which mydriasis, occasionally miosis, have been observed, usually with severe general symptoms, are more minutely discussed, according to their greater importance. On three very good lithographic plates the microscopical changes of the optic nerve in alcohol amblyopia are illustrated, and five charts of visual fields are added. Thus the book represents, in a complete and pleasant form, the present standpoint of our knowledge of the visual affections due to intoxications, each section being followed by an extensive bibliography. C. ZIMMERMANN.

Catalog of the Library of Dr. J. Hirschberg.

J. Hirschberg, Berlin, Catalog der Bücher-Sammlung von J. Hirschberg, M. D., 436 pages, Berlin, 1901.

He indexed systematically the books on ophthalmology, optics and history of medicine which he collected for over more than thirty years, as a preliminary work to a systematic bibliography of ophthalmology, he intended to publish. His library is open to the profession and will be donated to the Medical Society of Berlin. The book is a very valuable index of the literature of the above mentioned branches of medicine which will be greatly enjoyed by every physician with literary tastes. C. ZIMMERMANN.

Kroll's Orthoptic Exercises, Consisting of 30 Plates in Black and White as Recommended by Dr. Würdemann.

Published by Chambers, Inskeep & Co., Chicago.

In Vol. X, page 197, we reviewed and recommended the 5th improved and enlarged edition of Kroll's stereoscopic pictures, edited by Dr. R. Perlia. Here we have a new edition with directions modified by Würdemann and introduced by the following preface: "Kroll's plates are published in colors and are comparatively expensive to those here presented. The cost renders their use impossible in dispensaries, or even in many cases in private practice, as it is necessary to provide each patient with a set of cards. These which are recommended by W., are inexpensive, answer the same purpose as the colored pictures and have proved to be quite as interesting in the case of children." "The spectacles prescribed by the oculist must be worn while the stereoscope is

used. A special form of stereoscope of moderate expense is made in which the spectacles may be placed in a clip and thus held in the proper relation to the eyes and to the pictures." We heartily recommend the pictures and the stereoscope. C. ZIMMERMANN.

Stereoscopic-Photographic Atlas of the Pathologic Anatomy of the Eye.

Elschnig, Prof. Dr. A., Vienna. Stereoskopisch-Photographischen Atlas der Pathologischen Anatomie des Auges, Thiel I u. II mit beschneibendem Texte. Wien. Price 4 M. ($1.00) each part.

There are four parts, each consisting of 16 stereoscopic-photographic plates of enucleated eyeballs, 64 in all, with case histories. Of these, parts I and II, i. e., 32 plates have been issued. They are a valuable addition to the teacher's armamentarium and next to the eye specimens preserved in glycerine jelly, of which I have made satisfactory use in my own teaching. I consider them to be very valuable for the study of the actual pathologic conditions met with in ocular diseases, particularly of those involving gross changes in the shape or in the contents of the eyeball and especially of the results of ocular injuries. The author has had unparalleled opportunities to secure this large number of plates in connection with the large pathologic institute of the Allgemeines Krankenhaus, his own eye clinic and that of Prof. Dr. Schnabel. Of particular interest are the photographs of the exterior and interior of the eyes of different grades of refraction and of intraocular tumors. In some of the plates, the exterior of the eye is shown and in others the interior. The photographic work and reproduction is excellently well done and the text accompanying each plate is fully descriptive and comprehensive. H. V. WÜRDEMANN.

An American Text-Book of Pathology.

For the Use of Students and Practitioners of Medicine and Surgery. Edited by Ludvig Hektoen, M. D., Prof. of Pathology in Rush Medical College; and David Riesman, M. D., Prof. of Clinical Medicine, Philadelphia Polyclinic. With 443 Illustrations, 66 of them in Colors. W. B. Saunders & Co., Philadelphia and London, 1901. Price, $7.50.

The portion of this volume which calls for notice in the ANNALS is the article on *The Eye*. When it has been said that this article on the pathology of the eye was written by Ward A. Holden, the reviewer is of the opinion that it is not necessary to say anything more to commend it to the American ophthalmologist. Probably no other man in America is so well fitted to write such an article as is Dr. Holden.

The chapter on the eye fills 40 pages. It opens with a description of the development and normal structure of the eye—an entirely proper introduction to a description of the abnormal conditions. Then the pathologic changes, which occur in the various parts, are considered. A striking plate, under the subject of the conjunctiva, contains a set of drawings—and there are many valuable

illustrations in this article—showing the different microörganisms which most commonly cause acute conjunctivitis. Continuing a look through the article for the most interesting features of it, the fact is impressed on one's mind that it is not an article in which there are separate portions to be commended; one reads it and concludes that the whole subject has been handled most satisfactorily. The clear manner in which the subject is presented is worthy of note; and is presented briefly, but completely. One paragraph which will probably attract particular attention is that on coloboma.

This article is probably the best of its kind in the English language; it can be recommended to anybody, who is interested in the eye. And no ophthalmologist can afford to be without it.

Because of the fact that there are so many interesting articles in this American Text-Book of Pathology, the present reviewer finds it difficult to limit himself to the chapter on the eye—the book is such a one as we would expect Dr. Hektoen and Dr. Riesman to edit.

BROWN PUSEY.

Human and Comparative Pathology and Pathologic Anatomy of the Eye, by O. Lubarsch and R. Ostertag, Wiesbaden, 1901.

In this supplementary volume, we have a valuable contribution to the literature of ophthalmology; this statement is guaranteed by the fact that it appears as one of the numbers of Lubarsch-Ostertag Ergebnisse der Allgemeinen Pathologie, etc. And, when we notice the names of the gentlemen who have contributed to this particular number, we have the more reason to be pleased; we find on the title page, "Bearbitet von," Th. Axenfeld, K. Bass, K. Grünert, E. Kauffmann, O. Königshöfer, W. Koster-Gunz, F. Peppmüller, G. J. Schoute and K. Heilbronner.

As is the plan of this publication, the volume before us is a critical summary of recent literature, and an idea of its completeness my be given by the statement that 556 pages are required to review the literature of the nine subjects that are considered.

BROWN PUSEY.

A System of Physiologic Therapeutics.

A Practical Exposition of the Methods, Other than Drug-Giving, Useful in the Prevention of Disease and the Treatment of the Sick. Edited by Solomon Solis Cohen, A. M., M. D., Professor of Medicine and Therapeutics in the Philadelphia Polyclinic; Lecturer on Clinical Medicine at Jefferson Medical College; Physician to the Philadelphia Hospital, etc. Volumes III and IV—Climatology, Health Resorts, Mineral Springs—By F. Parkes Weber, M. A., M. D., F. R. C. P. (Lond.), Physician to the German Hospital, Dalston; Assistant Physician North London Hospital for Consumption, etc., with the Collaboration for America of Guy Hinsdale, A. M., M. D., Secretary of the American Climatological Association, etc. In Two Books. Book I—Principles of Climatotherapy—Ocean Voyages—Mediterranean, European and British

Health Resorts. Book II—Mineral Springs, Therapeutics, etc. Illustrated with maps. Price for the Complete Set of Eleven Volumes, $22.00 net.

These are the Third and Fourth Volumes of Cohen's System of Physiologic Therapeutics, whose timeliness has already been commented upon. The first part treats of the factors of climate, with their effect on physiologic functions and pathologic conditions, and describes the fundamental principles that underlie the application of climates, health resorts and mineral springs in the prevention of disease, and to promote the comfort and recovery of the sick.

The second part describes health resorts; and the third part discusses in detail the special climatic treatment of various diseases and different classes of patients. Book II also describes the health resorts in Africa, Asia, Australasia and America.

I cannot help liking such clean, healthy looking books as these latest two of Cohen's System. The clear type, the heavy paper and simple binding, make them easy to read from the start. Perhaps read is not the best word, after all, for many of the pages run like Webster's dictionary, although the chapters devoted to climate in general, to the treatment of disease or to ocean voyages, are novel and interesting. There is here a vast amount of information, with a most complete index, so that to look under a disease to its climatic treatment, or under a health resort to the disease benefitted there becomes an easy matter.

The first volume contains ten chapters which, after describing in Part I climate and climatology in general, leads one en tour through European health resorts in detail, ending with a description of the chief towns of Europe, so far as their social opportunities and climatic advantages or disadvantages are concerned. The second volume offers one a similar itinerary through Africa, Asia, the Pacific Islands, South and Central America with the West Indies, Mexico, Canada and the United States. Certainly there is enough here to choose from, and the statement given seems so sincere and conservative that one feels that reliance can be placed on it. The third part deals with general management of patients and climatic therapeutics for various diseases.

In the first volume there are XV maps, in the second XII, and in both, tables for conversion of altitude, temperature and distance from one scale to another.

The whole is a big task both for publisher and editor, but it has been well accomplished. The Spanish remarks need retouching, I should say, with more elaboration as to detail, for it helps but little to remark that Santa Agueda has cold sulphur springs; one should know more or nothing, since travellers not infrequently ask about Spain for invalids, and to quote names only, is useless.

In volume I, page 20, pure air is said to contain 20.7 parts per cent. by volume of oxygen, while the narrow streets of London contain only 20.8 parts per cent. A pleasing paradox! On page 26 the reference to the Labrador current should be Plate IB. In discussing sea climate and voyages in general (page 85) a drawback is found

in the fact (?) that fresh vegetables and fruits are lacking; this is of course true of the traditional long voyage, but it need not hold to-day when tours are advertised in every magazine, such as the West Indian tour, which is really a long voyage, but include stops at so many islands and Carribean ports that one danger to the passenger is over indulgence in fruits, vegetables and fish provided by the ship or sold for a song by clamorous natives, and in going to Venezuela by Porto Rico, for instance, on the Red D Line, the table is loaded with all tropical delicacies of the freshest character. In fact, Venezuela, the most easily accessible, attractive and delightful of our South American neighbors, receives too scant mention. (If the editor likes, I will gladly add a paragraph here for the next edition.) The legend for Plate IX has been omitted.

In Volume II, chapter XIV, page 50, the Andes are said to have a mean height approximately of about 12,000 feet; neglecting the tautology, one must question such a dizzy altitude. Perhaps the editor would say the Andean peaks (cut off at 8,000 feet above the sea), but this statement is bewildering. On page 148, Bay St. Louis and Pass Christian are given as on opposite shores of Lake Pontchartrain. This is not true; they lie on the Gulf of Mexico, and St. Louis Bay is the body of water separating them. It is a surprise even to the Chicagoan to hear (page 211) that the wind movement here is 69,000 to 145,000 miles! No wonder we are called the windy city. Pratt Institute (page 215) is in Brooklyn, not (our idea of) New York City, which makes a difference to the intending student, for Brooklyn claims a winter climate distinctly warmer and more equable than that of New York City. Page 221 gives Saltillo, Mexico, as in the State of Columbia; there is no such Mexican State; it should read Coahuila. Pyrenees though, in the text, does not appear in the index to Volume II. There is here given a most complete description of the climate of the Hawaiian Islands. This is certainly timely and valuable, and should be read by every one proposing a visit or residence in our Pacific possessions.

I hope the editor will pardon these few corrections. The books are so thorough and trustworthy that slight inaccuracies but intensify themselves, and I can think of no better way than this to obtain correction. The specialist will find Chapter XVI (Vol. II) full of valuable hints, since after all the eye is but part of the body and often needs for its restoration to health more than local treatment; this is especially so in trachoma, and we all know, which the editor seems to have forgotten, that traditionally trachoma has become more benign as the patient or community rises in the world.

The existence of sanatoriums for special diseases, as those at seaside resorts for scrofulous and weakly children, and in various regions for consumption, nervous affections, diseases of women, and the like are specified; and the mere list of such places, as found in the index, are likely to prove invaluable for reference. A glance at the closely printed pages of the index will show how full is the treatment of special resorts and their particular qualities. Like the preceding volumes, these are scientific and practical, a combination that reflects credit alike on authors and editor. A. B. HALE.

Physician's Visiting List for 1902.

P. Blakiston's Son & Co. have kindly sent the ANNALS OF OPHTHALMOLOGY the (Lindsay & Blakiston's) little volume for the current year. It is now in its fifty-first year of life, and deserves to reach the century mark. I use the book myself for my daily account record, and find that it simplifies the task. The usual information as to doses, the metric system, etc., is given. It is so comfortable for all purposes that there would seem no chance to suggest any criticism or an improvement. A. B. HALE.

Clinical Lectures on Diseases of the Eye.

Colburn, J. Elliott, M. D. Professor of Ophthalmology, Chicago Polyclinic. Expressley prepared and arranged for the practitioner of medicine and surgery. The Clinical Review Publishing Co., Chicago, 1902. Price, $3.50.

These pages are arranged from Dr. Colburn's clinical lectures and are intended for graduates in medicine who are beginning the study of Ophthalmology. The subjects covered are the more common injuries, diseases and errors of the eye and their relation to general conditions, being an exposition of the author's practice. I am particularly pleased with the subject matter of the book and with its style and composition. Dr. Colburn's students are fortunate in their master as is shown that he is thoroughly up to date in the subjects whereon he lectures and which are reproduced in this volume.

The book is particularly strong and safe as to treatment but it does not go into pathology as much as would be expected for a modern ophthalmic student. It is an exponent of such practice as may be carried out in hospital clinics, but for private patients the directions are not sufficiently explicit as to home treatment. dosage of medicines, nursing, etc. Not all of us will agree with the author of the efficacy of finger nail expression of granulations, which at best has to be repeated a number of times, whereas one thorough grattage or brossage by instrumental operation under an anesthetic is usually sufficient to remove the trachoma tissue. The same may be said as regards the author's methods of tenotomies in heterophoria. In other respects the subject matter of the book, especially as regards method of treatment, agrees with that of the most modern school of scientific ophthalmic practice.

The work is heavily and originally illustrated, there being many cuts in the text and large number of plates. While the artistic qualifications of the illustrations are not of the highest, their originality and appropriateness to the subject matter atones very largely for technical deficiencies. The work occupies a distinct place in American ophthalmic literature as an exponent of modern clinical practice. It is recommended to students and practitioners of ophthalmology. H. V. WÜRDEMANN.

Lessons on Ocular Therapeutics.

Dr. A. Darier, Président de la Société d'Ophtalmologie de Paris, Membre de la Société francaise d'Ophtalmologie, Membre de la Société d'Ophtalmologie de Heidelberg, etc.

This work consists of a series of twenty-four lectures delivered at the "Faculté de Médicine de Paris in the summer semester of 1901. They constitute a book of nearly four hundred pages devoted to the consideration of the therapeutic measures—whether local or general, medicinal, manipulative or operative—now used in ophthalmic practice, with a very special stress upon the more modern methods and drugs so rapidly finding their way into use, with which phase no name has been more associated than that of Darier. The very newness of many of the drugs and methods treated of and the consequent lack of much experience with them necessarily prevents at the present time a critical review of many parts of the work.

The opening chapter contains a general discussion of the subject and of the methods by which progress has been made in the past and should be continued in the future, originality and boldness in clinical work and persistent therapeutic, physiologic and bacteriologic experimentation; the careful observation of the incidenial as well as the primary effects of treatment, etc.

He reviews briefly the condition of ocular therapeutics twenty years ago, deploring the lethargy and lack of initiative which succeeded the brilliant therapeutic advance of Von Graefe, and stating that it was then summed up in the "omnipotent triad," "mercury, nitrate of silver and atropine."

With regard to the use of the latter drug in phlyctenular keratitis he states that whereas it was formerly the main dependence, now he rarely uses it, finding in adrenalin and yellow ointment specifics for the affection when the *general condition is not too much affected*—reserving atropine for those cases in which the keratitis is central and very obstinate. We believe that experience in this country would not bear out this position—would not put all such affections into one group, but would subdivide them etiologically, and therefore therapeutically, into two or three at least, one of which would be accommodative in its origin. In this rather large group, atropine is extremely effective if not specific in its action.

The newer anesthetics and analgesics, mydriatics and myotics are briefly referred to.

The second and third lectures are devoted to the methods of using mercury internally and locally, by the stomach, inunction, hypodermatic, intravenous and subconjunctival injection.

With the *galvano-cautery and subconjunctival injections of cyanide of mercury or chloride of sodium, every infective ulcer of the cornea, taken in time, will be promptly cured.*

Other conditions in which these injections are efficacious are then discussed.

Chapters 4, 5 and 6 discuss ocular anesthetics and analgesics, among the latter group chiefly acoin and dionin. To the latter, its uses in many pathologic conditions, methods of application and effects, Lecture 7 is entirely devoted.

Lecture 8 discusses the value of adrenalin as a diagnostic agent, and from a therapeutic and operative standpoint. No undue stress is laid upon its therapeutic value.

The mydriatics and myotics now commonly employed, as well as astringents, antiseptics, etc., are then taken up. Considerable space is devoted to the consideration of the salts of silver, of which protargol is considered by far the most useful. In connection with this, the author puts forward a tentative classification of types of conjunctivitis and after a warning against lauding any new method of treating ophthalmia unless the diagnosis of the type is confirmed by bacteriologic examination—a point certainly well taken. He also urges on clinicians more familiarity with simple laboratory methods, so that a bacterial diagnosis may be made in the clinic.

Space does not permit reference to many important topics. Emphatic advocacy of subconjunctival injections in cases of hypopyon ulcer we should expect to find in this work, and we do not look for it in vain. "It is here in fact that they give marvelous results."

The treatment of detachment of the retina is fully dealt with, and recent reports of favorable results with subconjunctival salt injections tending to a more hopeful prognosis.

In chapter 23 the therapeutics of optic-nerve disease is the subject, and here again the injections of sublimate, cyanide of gold, etc., are advocated and some remarkable cases of recovery from severe retrobulbar neuritis are reported. Criticism of this chapter is impossible for reasons already given.

Finally the use of various kinds of massage in affections of cornea and lens, in myopia, strabismus, glaucoma, etc., is discussed.

It must be admitted that Darier is a suggestive and energetic therapeutist, and it is impossible to peruse his lectures, which throughout are lucid, interesting and easy to read, without pleasure, edification and mental stimulation.

The publication of these lectures in book form is certainly justified.

F. W. Marlow.

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GLAUCOMA—AN EXPERIMENTAL STUDY.

BY EDWARD B. COBURN, A. M., M. D.,

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A disease which ends in blindness merits investigation. Glaucoma causes from 10 to 15.5 per cent. (the latter in Russia) of blindness, ranking fourth in the order of destructiveness. Thus, the official statistics (1886) for blindness in Russia show the number totally blind to be 190,000, of which 28,950 were blind from this disease. According to the eleventh U. S. census (1890) this country contained 50,411 persons blind in both eyes. Accepting Oppenheimer's figures at 10.84 per cent. we have 54,464 cases of blindness in the U. S. from this disease alone. Thus far all efforts have been unavailing to determine the etiology of this disease.

CLINICALLY. this disease is marked chiefly by hardness of the eyeball, shallow anterior chamber, discolored iris and dilated pupil, cupped disc, arterial pulsation, constricted field of vision, and eventual blindness. It is admitted that all these conditions are not always present but the atypical cases point rather to some unusual cause or anatomical anomaly.

Two forms of glaucoma are recognized, primary and secondary, but we shall confine our attention to the first.

The primary form is manifest in two types, the simple chronic, and the inflammatory—and these forms, especially the former, we shall consider.

The MORPHOLOGICAL LESIONS are various and the numerous theories which have been advanced to explain this disease depend for their basis upon the interpretation given to the lesions. Thus, the closure of the anterior chamber and the adhesions of the root of the iris to the posterior surface of the cornea, the abrupt bending of the nerve fibres and their atrophy, the backward displacement of the lamina cribrosa and the cupping of the disc, besides the various vascular changes noted in the different tunics of the eye—all are found with general constancy, but the difficulty of determining which are primary and which secondary and the ascribing to each its particular value and relationship makes the problem difficult.

It seems satisfactoraly proven that the aqueous has its origin from the ciliary region (whether from glands or other structures is immaterial at this time).

The exit of the aqueous is from the anterior chamber through Fontana's spaces into Schlemm's channel. In the eyes of animals usually employed for laboratory experimentation, as cats, dogs and rabbits, there seems to be some absorption through the anterior surface of the iris. At the posterior pole of the human eye the passage of fluid is practically nil. In the eye of animals the amount which escapes by this route is estimated at about one-fiftieth of the total production.

Now, the most marked conditions of glaucoma are the increased tension and the adherence of the root of the iris to the cornea with the consequent blocking up of Fontana's spaces and Schlemm's canal.

What is necessary to produce these conditions?

To represent the matter schematically let us consider the following:

(1) Exits unimpaired.
Secretion increased (theory of "Hypersecretion").

(2) Secretion unchanged.
Exits diminished (Retention theory) { By optic nerve. / By closure of angle of anterior chamber.

Hypersecretion has never been proven. It may be

inferred clinically in the inflammatory cases or from the congested ciliary body and processes occasionally found microscopically in recent cases.

In accordance with hydrostatic laws intraocular pressure is extended equally on all parts of the eye and this has been demonstrated experimentally. If such is the case, pressure on both faces of the iris would be the same and its position would be unchanged. Thus, a simple increase of the fluids of the eye is not sufficient.

Regarding the retention theory and the obstruction of the aqueous at the optic nerve, it would seem that the frequency of optic-nerve disease unassociated with glaucoma is sufficient disproof of this as a cause. Considering the other cause, namely, the blocking of the exits of the anterior chamber we have the following possibilities:

(1) Altered secretions and deposits.

(2) Deposits, contraction and so-called "Sclerosis."

(3) Pressure from behind (mechanical, either with or without inflammatory accompaniments).

(1) Altered secretion and deposits of pigment, fibrinous and albuminous material are not infrequently shown both clinically and on microscopical examination. This may occur in serous iritis or cyclitis, spongy iritis and iritis glaucomatosa (probably identical) where the tension may be considerably increased. This condition can be also experimentally produced and where occurring alone is always associated with deep anterior chamber.

(2) Sclerosis of the anterior chamber may be assumed as possible from ectropium of the uveal layers of the iris, from the clinical appearance of the iris which frequently looks thickened and tufted, and from the fact that fibrinous deposits (which have been demonstrated) are replaced by connective tissue as has been shown to occur in the eye under certain conditions. This does not imply or require more than an extremely slight degree of inflammatory action and the new material thus formed may, in contracting, pull the iris forward from its angular attachment.

That this alone is insufficient seems evident though it may serve in some slight degree as a factor.

(3) We now come to the last cause of the closure of the anterior chamber, viz., by pressure of the iris from behind upon the cornea and Fontana's spaces. Bitzos

says: "It is necessary to reject all theories explaining glaucoma by localizing the lesion in the sclera, choroid or zonule for several reasons; above all because they do not explain the propulsion of the iris." One is thus compelled to find the cause behind the lento-zonular diaphragm.

This is true only in part. The lens occupies a forward position and is either pushed or dragged into that position by the forward movement of the ciliary process, carrying the zonular ligament with them. Priestley Smith has shown that the hyaloid fossa is filled with aqueous in glaucomatous eyes thus establishing a vicious circle; the more pressure behind the more blocking up of the angle.

Theoretically, the pressure from behind upon the root of the iris may arise according to the various theories from,

(1) The narrowing of the lento-ciliary space due to the relatively abnormal size of the lens (according to Priestley Smith) or,

(2) From the enlargement of the ciliary body and processes.

The constant factors (comparatively speaking) are the sclerotic and lens, and the ciliary body and processes are the variable ones. So the inquiry seems to be narrowed down to the location of the disease in the ciliary body and its processes.

The occasional neuritis, visible ophthalmoscopically, the appearance of the iris, changes in ciliary body, altered secretion, pigment in the angle and the angle closed, all point to a process originating behind the iris in the ciliary region.

Hereditary Glaucoma points to unusual anatomical construction:

(1) In the size of the ciliary body and processes.

(2) In the lens.

(3) In the exits from the anterior chamber.

(4) In the constitutional tendency to vascular disturbances.

We have shown that the lens and the exits apparently play only secondary parts in the causation of this disease so we again are brought to the ciliary region for the origin. Hypermetropia also points to the ciliary region;

the ciliary muscle in such eyes being normally large would encroach more upon the lento-ciliary space and also upon the root of the iris.

Constitutional factors in the shape of arterio-sclerosis, gout and rheumatism are too little understood to permit of any definite conclusions. Any one of these or a vaso-motor paresis causing ciliary congestion may be an exciting cause.

A Résumé of the Attempts to Induce Experimental Glaucoma in Animals.

The investigators who have attempted the artificial production of glaucoma are few in number but the expedients employed have been varied and numerous.

Bentzen destroyed the anterior ciliary veins. He unsuccessfully used bacteria, ring-formed synechiæ, ignipuncture of the sclero-corneal margin, ammonia and iodin but was successful by scarification of the pectinate ligament.

Van Geuns ligated the vorticose veins, as did also *Exner* and *Leber*, *Schnabel*, *Weber*, *Priestley Smith* and others.

Berberich injected sterilized and alcoholic solutions of the staphylococcus aureus, producing a fibro-purulent inflammation of the periphery of the iris and adhesion to the cornea.

Koster and *Stölting* both closed the vorticose veins.

Wagenmann excised parts of the cornea and obtained anterior synechiæ but with little success.

Ulrich and *Andogski* and *Selenski* made similar attempts.

Duclos and *Valude* scarified the angle of the anterior chamber.

Schoeler cauterized the corneo-scleral margin.

Sulzer used injections of oil.

Bajardi introduced vitreous into the anterior chamber.

Sachsalber tried paracentesis of the cornea.

Geering made subconjunctival injections of sublimate solution and produced anterior synechiæ but no glaucoma.

Knies introduced irritants into the eye and sought to produce glaucoma by inflammatory adhesion of Fontana's spaces and Schlemm's canal.

With the exception of Geering's efforts these experiments are divisable into two classes: First, those which endeavor to produce secondary glaucoma; and second, those which sought to close the exits of the anterior chamber by gross mechanical means or by the direct introduction into the eye of foreign material. About all that has been proven is that closure of the exits of the eye causes plus tension. All fail to produce the natural mechanics of the disease.

THE AUTHOR'S EXPERIMENTS.

Geering's experiment is distinguished from the others in that the irritating material was introduced into the eye through the blood or lymph channels. This method of introducing substances into the eye while maintaining its integrity, seems to fulfil the requirements more satisfactorially and accordingly I undertook to produce glaucoma artificially, following as closely as possible the ideal conditions; namely, to *produce intraocular changes by extraocular manipulation*, as shown by the last group of experiments.

Four series of experiments were undertaken:

(1) Studies on the course of the lymph streams in the anterior segment of the eye.

(2) Studies on the effect of increased pressure in the anterior and posterior chambers.

(3) Observations on the result of the introduction of foreign material into the eye.

(4) The indirect introduction of substances through the circulation and the closure of the channels of exit by effecting changes in the ciliary region and aqueous.

(1) *Course of Lymph Streams in Eye.*

The *course of the aqueous* was followed chiefly by the use of India ink and Berlin blue injected into the anterior and vitreous chambers. These experiments need not be detailed here as the results obtained follow closely those of other investigators.

The pigment appears to be filtered out by the meshes of the pectinate ligament but in some eyes it could be followed into the root of the iris and into the ciliary body,

passing backward in a line parallel to the sclerotic toward the suprachoroidal space.

At the posterior pole the pigment was found in the perivascular lymph spaces of the vessels of the optic nerve and in the sheath of the optic nerve.

The large size of the exits in animal's eyes as compared with the exits in the human eye was particularly noteworthy.

(2) *Effect of Increased Pressure in Ey. .*

In the second group of experiments the effect of intraocular pressure by injection of saline solution into the aqueous and vitreous chambers was studied.

Hypodermic needles were inserted into the eye and connected by tubing with a reservoir placed above the animal so as to secure different degrees of pressure. Pressure from normal up to 50 mm. of mercury was employed, the time of injection varying from two to twenty hours.

The animals were anesthetized and so fastened that accidental displacement of the needle was impossible.

In one experiment with the needle in the anterior chamber and the pressure at 30 mm. the depth of the aqueous chamber appeared normal. In half an hour the cornea became steamy and shortly afterward the pupil began to dilate slowly. At the end of an hour the epithelium appeared roughened and a small bleb appeared.

In another experiment with the pressure at 45 mm. the cornea became steamy in twenty minutes; the pupil was widely dilated in one half hour; in forty-five minutes the epithelium was roughened and three minutes later a large bulla began to develop in the center of the cornea. This enlarged rapidly in a horizontal direction, extending to the sclero-corneal margin. This bulla appeared to be filled with fluid which settled by gravity and enforced by the continued pressure stripped off the anterior layer of epithelium but remained intact, containing the fluid as in a bag. During the whole time the anterior chamber was deeper than normal. This was doubtlesss due to the increased amount of aqueous in the anterior chamber forcing the impermeable iris against the lens like a valve, preventing the passage of the salt solution into the pos-

terior chamber, the exits being unable to accommodate the increased quantity of the saline solution.

These experiments were performed on four animals with simultaneous injection of both eyes. In each case the effects observed differed only in intensity depending upon the degree of pressure and the length of time during which the pressure was maintained.

With the needles in the vitreous the effects observed were different. No change in the depth of the anterior chamber was noted when the pressure was only slightly exaggerated, the exits apparently being able to take care of the somewhat increased amount of fluid. But when the pressure was greatly augmented or continued for some time the iris was pushed forward. In this latter case the vitreous was either displaced with a forward movement of the lens, ciliary processes and iris or the congested ciliary processes and lens were factors in the propulsion of the iris. Whether or not the vitreous was displaced (and the possibility of this under similar conditions is denied by Leplat) the congested ciliary processes were found crowded together and compressed between the lens and the iris, the angle being closed by the iris. A fibrinous deposit was found in the anterior chamber, lying on the iris and extending into the meshes of the pectinate ligament. The corneal epithelium was either edematous or stripped off and the stroma was also edematous. The meshes of the iris were open and the perivascular spaces of the iris vessels were greatly distended. The ciliary processes were edematous and with the pars non-plicata showed a condition similar to the vesicle formation described by Greeff after puncture of the anterior chamber. Vesicles were formed between the two layers of cells lining the ciliary region and for a short distance on the posterior surface of the iris.

(3) *Experiments by Direct Introduction of Substances into the Eye.*

The method of Knies was employed in another series of experiments but was discontinued as I was impressed with the idea that this method was faulty both in theory and technique. In almost every case the action was too violent and the reaction was hypotony. Fibrinous deposits were

usually found blocking up the angle of the anterior chamber (with the angle open) and where the iris was in apposition with the cornea it was evidently due to congestion of the ciliary processes even though exudation was also present.

(4) *Experiments by Indirect Introduction of Substances into the Eye Through the Circulation.*

The anatomical features having been observed, the effects of intraocular pressure and the behavior of the eye to the direct introduction of foreign bodies having been noted, there was now undertaken a series of experiments to determine the effect of introducing substances into the eye by the direct method; namely, through the circulation.

For sake of convenience the substances used may be divided into two groups:

(1) Acetic and phosphoric acids, adenin, adenin hydrochloride, calcium chloride, calcium phosphate, calcium sulphate, sodium urate and uric acid.

(2) Atropin, eserin, pilocarpin and salicylate of soda.

TECHNIQUE.

Cats and albino rabits were used and in the first group of substances subconjunctival injections of 5 to 10 minims of solution or emulsion were made once a day for three months. Little difference was noted between the cats and the rabbits; the latter, however, were more easily managed and examined. In view of the readiness with which fibrin deposits were induced in the eyes during the previous experiments substances which assist in the formation of fibrin and are usually found in the body were injected, as well as others, forming the first group above.

The animals were killed by ether, chloroform or by breaking the neck. Immediately after death the eyes were removed and one of each animal was placed in 10 per cent. solution of formalin and the other in orthos fluid. This was followed by alcohol of increasing strengths and after imbedding in celloidin and cutting the sections were stained with hematoxylin and eosin.

Calcium phosphate 1 per cent. induced no changes—a

slight hyperemia of the ciliary processes was observed in the eyes.

Calcium sulphid, 1 per cent., induced slight congestion of the ciliary processes together with a vesicle formation already described by Greeff.

Calcium chloride in a 5 per cent. solution induced marked chemosis with some pannus due to the overriding of the cornea by the conjunctiva. The iris of the rabbits became less transparent and the color was grayish, showing a thickening of the iris. Bloodvessels on the anterior surface near the root of the iris were enlarged. The tension of the eyes was often temporaily increased but never permanently. Microscopically, congestion of the iris and especially of the ciliary processes was noted, together with the appearance of the vesicles on the pars plicata of the ciliary body. The connective tissue stroma of the iris was swollen and thickened.

The effect of *uric acid* and *sodium urate* in satured solution at blood temperature was similar. Slight change in color of the iris and decrease in the transparency of the albino iris was seen. The iris tissue was swollen and congestion of the ciliary bodies and processes with vesicles in the ciliary region were found.

Adenin and *adenin hydrochloride* in 5 per cent. solution induced slight hyperemia with a minimum amount of vesicle formation.

Acetic and *phosphoric acid* in one-half of 1 per cent. solution caused ciliary congestion. In two animals into which the acetic acid was injected abscess of the cornea with iritis developed in one case and perforation of the cornea from abscess with escape of the lens, and panophthalmitis in the other.

While no exudate was found in any of the above experiments, no change in the bloodvessels, no synechiæ, no obliteration of Fontana's spaces and only occasionally plus tension; it is not unreasonable to believe in view of the ciliary congestion and the formation of the vesicles that a change in the character of the aqueous with some coagulable material temporarily blocked up Fontana's spaces but disappeared as soon as the irritation ceased.

Some of the medicaments ordinarily used in ophthalmic practice were also tried; the eyes were hardened in

Flemming's and Zenker's solution, in addition to the other two solutions mentioned above.

Two minims of a solution of 1 per cent. of *atropin sulphate* were injected under the conjunctiva four times at intervals of six hours and induced no change except that the ciliary processes appeared depleted as compared with other eyes.

Pilocarpin administered in the same way and of the same strength induced an exudate of coagulable material and a slight iritis. Vesicles were found on the ciliary processes.

Eserin, one-third of 1 per cent. solution, was injected in two minim doses and induced in both cats and rabbits a profuse diarrhea with great prostration and convulsions. In four rabbits a two per cent. solution induced more severe symptoms, with rapid oscillations of the eyeballs, alternate mydriasis and myosis and finally death. This solution injected into two cats produced very severe and similar symptoms. One was allowed to recover and the other was killed during the convulsions. In the animal which recovered no trace of any disturbance was found, the animal living twenty-four hours after the injection. In the animals which died or were killed during the height of the poisoning the anterior and posterior chambers were filled with a fibrinous exudate containing polynuclear leucocytes and red blood cells. Vesiculation was very marked and the inner layer of ciliary cells appeared to be cast off as a result of the violence of the reaction and the bursting of the vesicles. A fibrinous coagulum was also observed in the anterior scleral vessels near Schlemm's canal. The exudate in the anterior chamber was so large that the iris and lens were displaced backward. The tension was raised during the acute process.

Salicylate of *soda* was injected five times in three minim doses of a 5 per cent. solution at six hour intervals. With plus tension the anterior chambers were deep. These animals were killed one hour after the last injection. Microscopically, the corneal stroma and epithelium were edematous and the anterior chamber was deep, filled with a large quantity of fibrinous and coagulable material, the latter next to the cornea. The fibrin deposit was in several layers as though a fresh exudation had been caused

by each injection. The iris was bent backward at right angles to its normal position for a portion of its width, the remaining portion lying in a plane parallel to its original position. The posterior chamber was thus displaced backward and was practically abolished. Polynuclear leucocytes and extravasated red blood cells were numerous. A zone of red blood cells could be traced from the angle of the anterior chamber to the suprachorioidal space. The ciliary bodies were congested and vesiculated, surrounded by a mass of fibrin. The chorioid was greatly congested. This fibrin deposit is similar to that illustrated by Fuchs in his 1899 text book, American edition, under the head of "serous iritis."

In comparing the fibrin deposits induced by eserin and salicylate of soda with those produced by injecting substances directly into the eye (as ink, oil, etc.) or even that found in the eyes subjected to increased pressure, we find in the former a layer of fibrin gradually increasing in density up to the iris, containing leucocytes and blood cells, the red cells lying thickest against the iris. In the other eyes the deposit of fibrin is tufted, the tufts usually surrounding a round, clear, highly refracting body, probably a degenerated leucocyte. The increased depth of the anterior chamber and the position of the iris shows that the fibrin was formed in the anterior chamber and was probably an exudate from the iris. A certain amount was formed in the ciliary region but did not compare in quantity with that formed near the iris. This deposit of fibrin filling the meshes of the pectinate ligament obstructs the flow of aqueous and raises the tension.

SUMMARY.

The results of these experiments may be summarized as follows:

(1) Intraocular changes may be induced by deleterious substances in the circulation.

(2) The effect of irritating material in the circulation induces, first, congestion of the ciliary body and iris and then vesicle formation in the ciliary region followed by fibrinous exudate into the anterior and posterior chambers.

(3) Fibrinous and albuminous exudates have a predi-

lection for the anterior chamber, depositing or forming on the anterior surface of the iris and in Fontana's spaces.

(4) These deposits, usually accompanied by deep anterior chamber, block up the exit at the angle and increase the tension. When the irritation is brief the exudate may be absorbed and the tension return to normal. If the irritation is sufficiently prolonged or intense, glaucomatous iritis with its attending evils may ensue.

(5) The cause of glaucoma is apparently some lesion which pushes the iris and lens forward making the anterior chamber shallow and blocking the exits at the angle with the root of the iris. This cause is to be found in the ciliary body and processes.

REMARKS.

While these experiments have not added directly to our knowledge of the causes of glaucoma they have thrown new light on the functions of the ciliary body and iris and on the conditions under which serous and fibrinous iritis and cyclitis occur and showing that the intraocular circulation of certain substances is quite sufficient to produce these diseases and therefore the constitutional elements should not be disregarded in their treatment.

We believe that the experiments were conducted after the method best adapted to the study and induction of changes related to intraocular diseases and that the eventual discovery of the etiology of glaucoma will follow along these lines. By introducing into the circulation some substance which is a physiological constituent of the body but which in abnormal amounts causes vascular changes or some end-product of tissue metabolism which is retained from faulty elimination, the desired results may be achieved. Failure in these experiments may be ascribed to two reasons; first, the anatomical differences between human eyes and the eyes of the animals used in the experiments. The formation and position of the ciliary body and processes with reference to the iris and angle of the anterior chamber together with the large factor of safety in the eyes of lower animals in the existence of large exits, both conspire against experiments of this kind. Second, to the intermittence of the material employed. In life the

causes are more or less constant, not interrupted as in these experiments.

My thanks are due in a large measure to Prof. Prudden, who kindly afforded, in the Department of Pathology, College of Physicians and Surgeons, N. Y., the opportunity for this experimental work and to Dr. Gies, in the Department of Chemistry, for assistance in the preparation of the adenin.

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A CLINICAL AND PATHOLOGICAL REPORT OF TWO CASES OF GLAUCOMA.

By Howard F. Hansell, M. D.,

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ILLUSTRATED.

Intraocular tension is increased, 1, when the filtration angle at the periphery of the anterior chamber is blocked by reason of forward dislocation of the root of the iris or by exudation from the iris of blood or other material or by detritus from a disencapsulated crystalline lens and, 2, by increase of the intraocular contents. Either of these factors will develop, if continued, one of the forms of glaucoma. It is readily seen then, that the word glaucoma, interchangeable with increased tension, signifies the symptom rather than the disease. It is a strictly local affection only when the increased pressure is induced by a purely local disease or by an accident or operation that destroys the normal physiologic and anatomic relations of the ocular structures. It is a local manifestation of a general dyscrasia when its origin may be traced to gout, rheumatism, syphilis, disorders of the sympathetic nervous system, altered function of the lymph system or disease of the circulatory apparatus including both the blood and the vessels. It is manifest that the cases of glaucoma that depend upon remote far outnumber those that are caused by local disturbances. Hence, our plain duty in all cases of idiopathic glaucoma is to make a searching investigation of all possible underlying causes to which its existence can be logically attributed and so direct our remedies that they may be more than of transient benefit. In the admirable paper presented before the American Ophthalmological Society, 1901, de Schweinitz argues convincingly for early iridectomy on the apparently sound eye because the disease is, sooner or later, bilateral. Its bilateral character is strong assumption that primary glaucoma is a constitutional rather than

a local disease. Perhaps these general statements cannot be better illustrated than in a study of the so-called hemorrhagic glaucoma by which I mean glaucoma preceded by retinal hemorrhages, of which Case I is an example. It seems to be well established by the microscopic studies that have been made by Reimar, de Bourgon, Pagenstecher, Randolph and others and by the reports of the pathologic investigations made by Posey, Shumway, and Oliver, that the most constant lesions of hemorrhagic glaucoma are found in the vessels of the retina, optic nerve and choroid and consist in endarteritis proliferans, phlebitis proliferans and thrombosis.

The lumen of the vessels becomes gradually choked, reducing the blood stream $^1/_4$ or $^1/_3$ its normal diameter, or entirely occluding it. Fresh hemorrhages are found in the structure or on the surface of the retina, the retinal cells and fibers showing retrogressive changes in different stages. The blood probably reaches the retina by diapedesis through the diseased vessel walls during periods of cardiac stimulation rather than by rupture. The connection between the condition of the retinal vascular system when it is favorable to hemorrhages or the presence of the blood in the retina and the subsequently developing increased intraocular tension has not been determined, but that some causative connection exists is shown by the number of cases of hemorrhagic retinitis that terminate in glaucoma. And it is in these cases of diseased blood vessels rather than of diseased blood that increased tension supervenes. All of us have seen individuals with extensive hemorrhages into the vitreous and retina following vessel rupture in nephritis, diabetes, cardiac hypertrophy, etc., who never have glaucoma. Therefore the fault cannot be laid at the door of the exuded blood but must be referred back to the endarteritis or thrombosis and the consequent disturbed circulation within the globe.

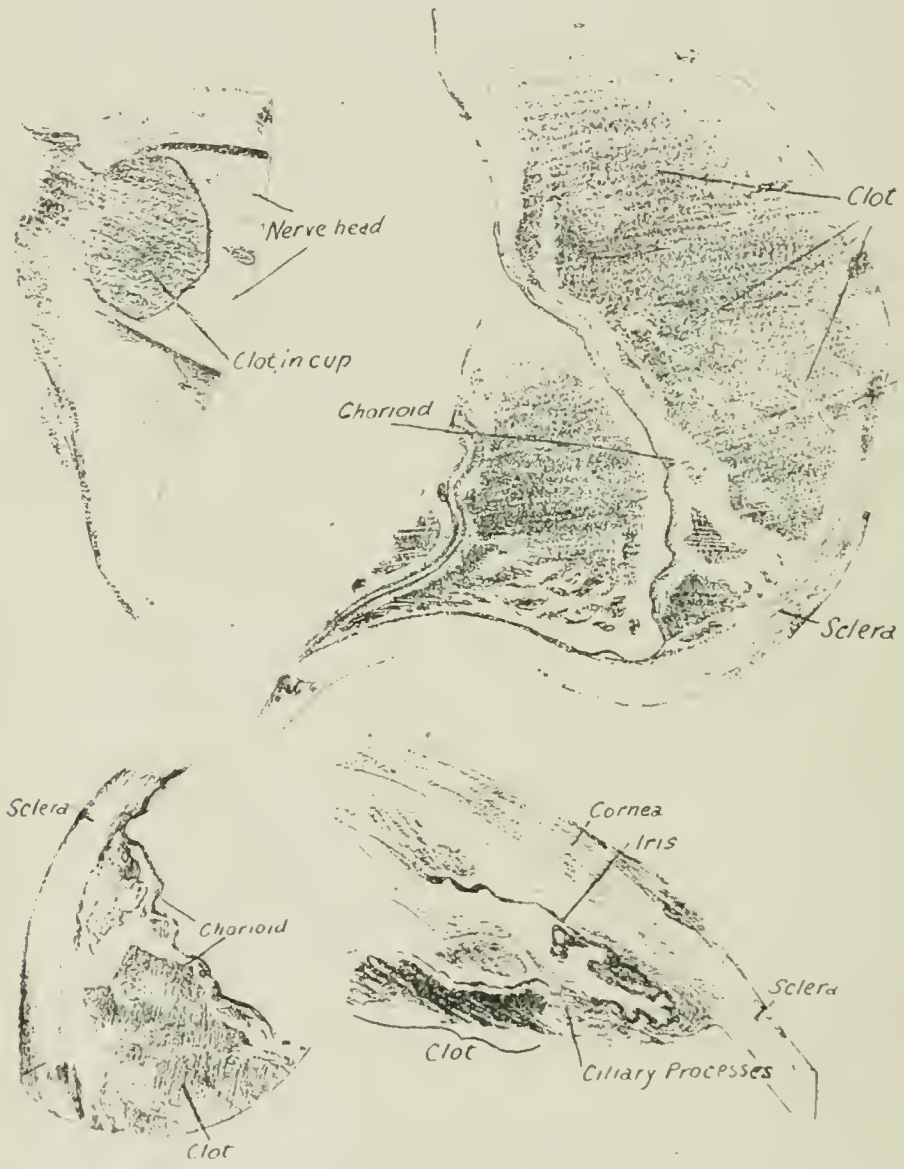
Case I. E. A. P., aged 69, applied at the Out-Patient Eye Department of the Jefferson Hospital, Sept. 23, 1901, complaining of gradual failure of vision for 3 months. Although he presented many of the signs of senility he gave no history of serious illness except rheumatism from which he had imperfectly recovered. Vision in the left

eye was reduced to the perception of light; the pupil was small and reacted but slightly to light and convergence. Under homatropin mydriasis, the lens was seen to have become partially opaque, the vitreous to contain a few floating opacities and the retina studded with hemorrhages. He was advised to enter the hospital for treatment but refused. One month later the eye became the seat of violent pain, ciliary injection was pronounced, tension = + 3 and vision was lost. He still declined treatment in the hospital and, in 2 weeks, after suffering intense pain relieved for 2 days by iridectomy, the eye was enucleated. Both operations were performed by Dr. C. W. Le Fever to whom I am indebted for the notes of the case.

Macroscopic Examination. The principal points of interest in the gross specimen are the dislocation into the anterior chamber of the lens, a patch of atrophy of the choroid far forward near the ciliary body and the numerous hemorrhages on the retina, all of which are well shown.

Microscopic Examination. Corneal stroma healthy and epithelium in place. The small lacunae between Bowman's membrane and the deeper layers of the cornea proper, as noted by Posey in the report of his case, were not seen. Iris adherent, from its root to its enlargement at the pupillary border, to the posterior surface of cornea where it was apparently amalgamated with Descemet's membrane. In the pupillary area of the cornea Descemet's membrane was covered with exudate, lens capsule and lens fragments showing lenticular synechiæ. Anterior chamber obliterated and contains a few small clots between iris and cornea. Iris thin, partly denuded on posterior surface of pigment, covered and infiltrated with exudation. Few vessels could be seen. Filtration angle entirely occluded. Canal of Schlem open in a few, closed in most places. The blood in the anterior chamber was probably caused by the iridectomy. It is continuous with a clot behind the ciliary body. Lens displaced forward in contact with the iris and partly surrounded by capsule. Anterior capsule and lens broken in pupillary area. Ciliary body infiltrated with blood but otherwise normal. Choroid generally in place. Retina infiltrated

with and covered by blood in many places both where attached and where separated from the choroid. The infiltration is limited to the fibrous layer. Retinal vessels filled with blood and surrounded with lymphoid cells. Vessel walls very thin.



Microscopic Sections Case II
Glaucoma

The second case is one of hemorrhage *following operation* and is an essentially different type of glaucoma. The pathologic specimens, both macroscopic and microscopic, demonstrate by the situation of the clot in the vitreous chamber and its relation to the retina and choroid that the vessels of the latter are responsible for the hemorrhage.

The blood was discharged suddenly and in large volume as shown by the complete destruction of the retina and the detachment and demolition of a large section of the choroid.

CASE II. Patrick Whelen emigrated to the United States in October, 1901. He states that before sailing he was entirely blind in both eyes with the exception of light perception in the left. He had suffered excruciating pain and rapid loss of vision in the right and no pain and gradual diminution of vision in the left. I examined him a few days after his arrival in America and found confirmed glaucoma in right and mature cataract in left eye. In the former the tension was + 3, iris widely dilated and immovable, cornea clear, anterior chamber obliterated, lens opaque, moderate ciliary injection; in the latter uncomplicated senile cataract. The shallowness of the anterior chamber precluded the passage of an iridectomy knife between the iris and cornea. In order to reduce tension I performed posterior sclerotomy and expelled through the cut a small bead of vitreous and was thus able to satisfactorily excise a piece of iris. In the course of the next hour the bandages became soaked with blood. The vitreous was forced through the corneal incision and the edges of the cut were separated by a clot. A few days later the eye was enucleated. After recovery from this operation I performed preliminary iridectomy in the left eye and in 10 days extracted the lens. Healing was rapid and uninterrupted. With correcting glasses vision equalled, 6 weeks after extraction, 6/6 partly.

MACROSCOPIC REPORT. The vitreous chamber is completely filled with blood. The largest clot occupies $^4/_5$ of the capacity of the chamber. The retina and choroid, extending from the optic nerve entrance forward to the ciliary body on the nasal side, are detached from the sclera and form the boundary of the clot. A second clot filling the remaining $^1/_5$ lies partly in front and partly behind the choroid. The smaller clot can be seen as it extends backward to fill the excavation in the nerve head.

MICROSCOPIC EXAMINATION. Cornea healthy. Lens dislocated into anterior chamber, partly encapsuled and resting on iris. Root of iris adherent to cornea obliterating the angle of the anterior chamber. Canal of Schlemm occluded in every section examined. Iris atrophic, contain-

ing a few vessels. Hemorrhage between conjunctiva and sclera. Ciliary body distorted, its processes pushed forward and lying in contact with posterior surface of iris. Its muscular fibers were atrophied. The body, including the anterior section of choroid, abruptly turned toward the cornea, totally detached from the sclera and ruptured by the pressure of blood which fills the vitreous chamber, behind the choroid and in front of the sclera. The detached choroid is surrounded by blood and broken in many places. The retina is totally detached from the choroid, broken and present only in small stripes, reduplicated and almost wholly destroyed. The papilla is deeply cupped and cup filled with blood. No retina can be traced from the papilla except a small fragment lying in the blood in the cup. The sclera is thin and denuded of choroid. On its temporal side anterior to the equator is a cicatrix through its entire thickness—the cicatrix of the sclerotomy. At its inner surface the retina and choroid are adherent. Its edges are not in correct apposition, the anterior lip being displaced outward, probably showing increased pressure in the anterior portion of the globe. The choroidal vessels, large and small, are filled with blood cells and surrounded by lymphoid cells. No thrombi found. Retinal blood vessels little in evidence.

NOTE ON THE VISUAL FIELD IN GLAUCOMA.

By Harry Friedenwald, A. B., M. D.,

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ILLUSTRATED.

The careful study of the field of vision in cases of glaucoma is of interest not only in giving information as to the degree and progress of visual impairment, but also because it aids us in determining the nature and the seat of the retinal lesion.

In one hundred cases studied by Bunge* the defects were as follows:

In 27 cases, defect in the nasal portion only;
" 44 " " " " " predominant;
" 4 " the field was limited to a small peripapillary oval;
" 9 " the center was lost and only a narrow strip was preserved, extending from the blind spot about 50° to the temporal side;
" 3 " the boundaries of the field were normal, and
" 1 " there was a slight nasal defect, but this case as well as the preceding three, presented central or paracentral scotomata;
" 2 " the effect extended upward;
" 6 " the fields were narrowed concentrically;
" 4 " the defect in the temporal portion predominated.

Of these hundred cases, eighty-eight showed typical defects, which are thus described by Bunge:

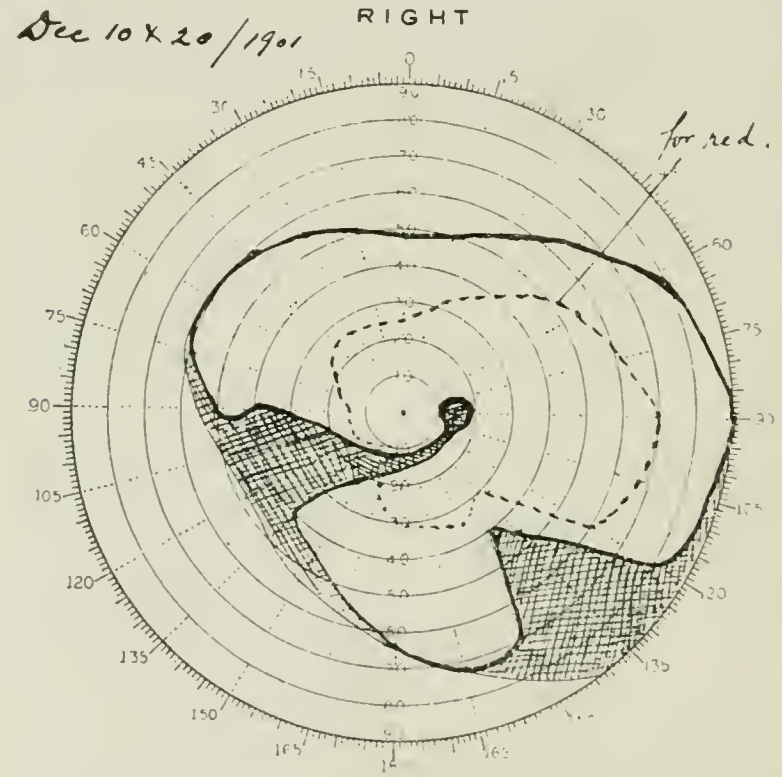
"Beginning in the nasal periphery, the impairment later appears in the temporal periphery; progressing slowly in the temporal periphery, it rapidly obliterates the nasal half, so as to produce an oval which extends about 50° from the macula toward the temporal periphery.

"Next it abolishes the function of the central portion up to the blind spot, leaving for sometime a narrow strip of vision on the temporal side of the blind spot."

*Bunge, Ueber Gesichtsfeld und Faserverlauf, etc., Halle, 1884.

Bunge concludes that the manner in which the field of vision suffers is only to be explained on the ground of the gradual expansion of a physiological into a glaucomatous excavation by the increased pressure of the vitreous.

At the Tenth International Medical Congress held in Berlin, in 1890, Bjerrum* described a new and more accurate method of examining the field of vision. He employed very small white objects on a blackboard at two meters' distance, a distance much greater than is possible



in any perimeter. The examination of cases of glaucoma by this method enabled him to find certain peculiarities of the defects, "which, though not always discoverable, occur with sufficient frequency to be regarded as characteristic of this disease." The peculiarity consists in the direct continuity of the defect with the blind spot. He illustrates the subject with the diagram of a field in which a large defect on the nasal side is continuous with the blind spot by a narrow band; (besides this there is marked and extensive relative diminution of vision throughout the rest of the field with the exception of the central area and of another larger area on the temporal side of the

*Verhandlungen des X Intern. Med. Cong., Band IV, p. 71.

blind spot and adjacent to it). Other fields are given which differ greatly from this in form, but all agree in that the defects, whether large or small, relative or absolute, are directly connected with the blind spot.

Bjerrum points out that these defects correspond with the distribution of the nerve fibers from the papilla into the retina; and he explains them on the supposition of lesion of the nerve fibers at the margin or in the wall of the excavation. "But whether this is due to pressure or to traction or to nutritive disturbances through vascular changes, is a question more difficult to answer."

Ole Bull* states that in a *few* cases he has observed such defects in the field in glaucoma which *could with certainty* be attributed to vascular lesion; this one case was proved



by ophthalmoscopic examination. In this case there were marked contractions of the lumen of the arteries, with subsequent dilatations, and he infers that in this case "the hindrance to the circulation must at some time have been so great, or so persistent, that the function of the retina was permanently lost." This, and similar observations, lead him to the conclusion that vascular lesions are of great importance in explaining defects in the visual fields in cases of glaucoma.

Bull has a drawing of the fundus of the case just referred to and a diagram of the field of vision which is of the same type as those described by Bjerrum. The defect occupies the entire lower nasal quadrant, and stretches up to the blind spot. In the drawing of the fundus, the superior temporal artery shows a marked diminution of its

*Ole Bull, "Perimetrie" Bonn, 1895, p. 177.

lumen. But the other branches of the central artery are equally affected, the superior nasal in fact more so.

Concerning defects of this form, Baas in his monograph "Das Gesichtsfeld"* says: "We can sometimes determine with the ophthalmoscope that the defect corresponds with the point of sharpest excavation; but in other cases, and these are the more numerous, this correspondence is not found."

But one writer has questioned the correctness of Bjerrum's results; Holth, of Christiana, maintains that the defects are due to "amaurosis by continuous fixation," and denies that they are typical of glaucoma.

This subject has recently been studied carefully by Meisling,† of Copenhagen, whose examinations were made by Bjerrum's method and were arranged so as to carefully exclude "amaurosis by continuous fixation." They are in complete accord with those of Bjerrum, with whose conclusions he likewise agrees.

The writer has recently had several cases of simple glaucoma which presented the peculiar defects described above. He desires to report the following case which is particularly instructive. It should be stated that the examinations were all made on the perimeter but that very small test objects were often used.

Miss X, aged thirty, consulted me during December, 1901. She had been myopic since childhood. For five or six years she had had recurrent attacks of glaucoma in the right eye, at long intervals, with increase of tension, rainbow vision, blurring of vision, but little pain. These had yielded promptly and completely to eserin and internal medication at the hands of her physician. In December, 1899, she had a very bad attack, which required ten days treatment with eserin before it subsided. Vision which had been very much obscured during the attack, became quite clear again. In December, 1900, although using eserin as a prophylactic, she again had an attack, more severe than any that had preceded it. On January 4th, 1901, an iridectomy was made by Prof. Hirschberg of Berlin, where she was spending the winter. The opera-

*Das Gesichtsfeld, Stuttgart, 1896, p. 212.

†Annales d'Oculist, CXXIV, p. 417. (Dec., 1900.)

tion was perfectly successful, and "vision became as good as ever." Since the operation, she has had one very slight attack of rainbow vision and blurring of the sight (July, 1901, eserin was used for a few days and the attack passed off.)

The left eye has always been well; on the evening of December 8, 1901, she had slight "rainbow vision" in this eye and became alarmed. It was on this account that she consulted me.

Dec. 9, 1901. The fundus of the right eye is normal excepting the optic disc. This presents a deep excavation leaving a narrow band of nerve tissue on the nasal side, where the excavation is very abrupt. On the nasal side the wall of the excavation is sloping. There is a small conus on the temporal side and a narrow area of chorioidal atrophy on the nasal. The blood vessels are normal.

The fundus of the left eye is similar but there is a little more nerve tissue preserved around the deep excavation, and there are three small, round chorioidal patches below the papilla (similar to chorioiditis areolaris). Central vision with correcting glasses is very acute (R E — 2. Ds ⊃ — 0.75 Dc Ax 120 $^{6}/_{5}$ $^{6}/_{4}$ —; L E — 2.75 Ds $^{6}/_{5}$ $^{6}/_{4}$). The field of vision of the right eye taken roughly on the perimeter corresponded with that taken after the operation at Hirschberg's clinic (a copy of which was in the patient's possession). That of the left eye was perfectly normal for white and for colors. The patient was seen frequently for several weeks and the fields taken repeatedly and with great care. This lead to the observation that the defect in the inferior nasal quadrant extended by a narrow prolongation into the blind spot (see diagram). This prolongation was not more than 2° or 3° in width, and required test objects two millimeters in diameter for its detection. A second defect in the lower temporal quadrant was likewise discovered. A careful search was made to determine whether this defect was likewise connected with the blind spot, but no connection could be found.

During the time the patient was under observation there was no evidence of a fresh attack of glaucoma; no myotic was used.

Having been much impressed with Ole Bull's statement that these defects frequently correspond with the course of

the artery, as well as by the peculiar form of the defect which is very suggestive of vascular disturbance I sketched the course of the vessels in the upper and upper temporal portions of the retina, which I may repeat appeared perfectly healthy, and on comparing the drawing (see figure) and the chart of the field, I find *no correspondence whatever between the defect and the course of the arteries.* The conclusion corroborates Bjerrum's view, that the defect is due to interruption in the course of the nerve fibres as they pass through the excavated portion of the papilla.

A careful examination of Bull's drawing, mentioned above, leaves much doubt as to the "accurate correspondence" and convinces the writer that however important the sclerotic changes in the vessels may be in the pathology of glaucoma, they are not the cause of the interesting forms of field defects as first described by Bjerrum.

MAUTHNER'S METHOD OF DIAGNOSING PARALYSIS OF DEPRESSORS OR ELEVATORS OF THE EYE.

By E. F. Snydacker, B. A., M. D.,

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In the discussion on diagnosis of paralyzed eye muscles, at the last meeting of the American Medical Association, there were one or two points not touched on that I thought an exposition of this schema of Mauthner's might bring out.

Difficulty in locating a paralyzed eye muscle is usually most marked when that muscle is either an elevator or depressor of the eye; diagnosis of an isolated paralysis of an external or internal rectus, usually being comparatively easy. Of all schemes for diagnosing a a paralyzed elevator or depressor of the eye, that one, which is most rational and has proven itself most reliable according to Fuchs, Sachs and others, who have employed this method for many years, is the following of Mauthner:

	Greatest difference in height between images.	Greatest difference in height of images.
Diplopia	Left and upward.	To right and upward.
	1. Higher image belongs to left eye. Paralyzed muscle is left superior rectus.	1. Higher image belongs to the right eye. Paralyzed muscle is right superior rectus.
	2. Higher image belongs to right eye. Paralyzed muscle is a right inferior oblique.	2. Higher image belongs to left eye. Paralyzed muscle is left inferior oblique.

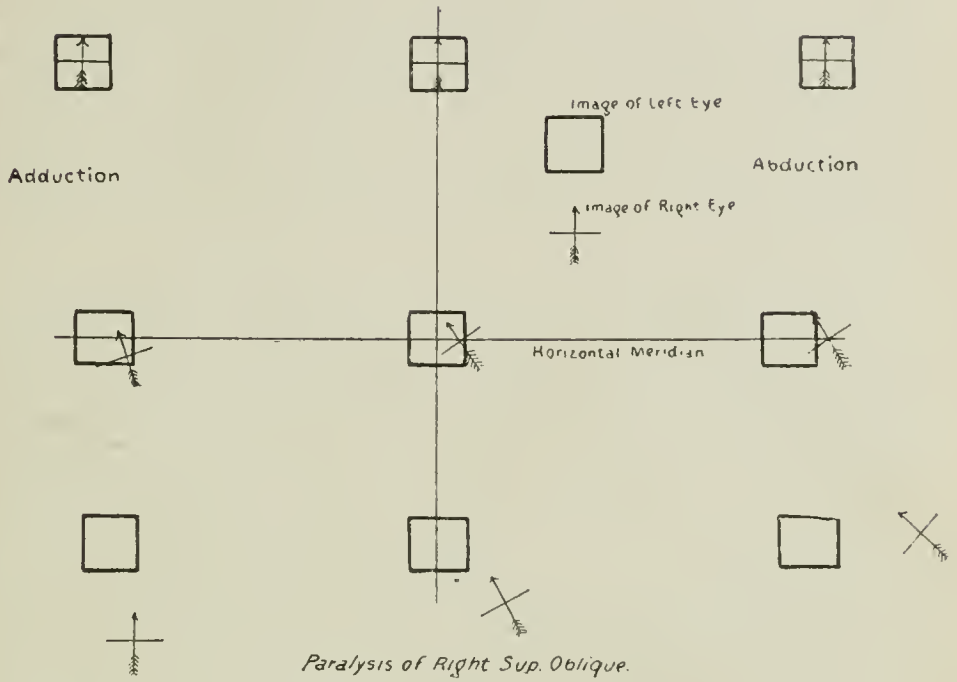
Greatest difference in height down and to the left.	Greatest difference in height down and to right.
1. Image of left eye lower. Paralyzed muscle is left inferior rectus.	1. Image of right eye lower. Paralyzed muscle is right inferior rectus.
2. Image of right eye lower. Paralyzed muscle is right superior oblique.	2. Image of left eye lower. Paralyzed muscle is left superior oblique.

For the sake of brevity, and in as much as this will serve to illustrate Mauthner's Method of reasoning throughout, we will confine ourselves to a consideration of a differential diagnosis in paralysis of the depressors of the eye, and it will serve to make things a little clearer, if we give a few moments' consideration to this rather crude model showing the axes of rotation of the eyeball, and the action of the eye muscles. External and internal rectus muscles cause the eyeball to rotate about this vertical axis, superior and inferior rectus muscles about the horizontal one, and the superior and inferior oblique about the sagittal or anter-posterior axis.

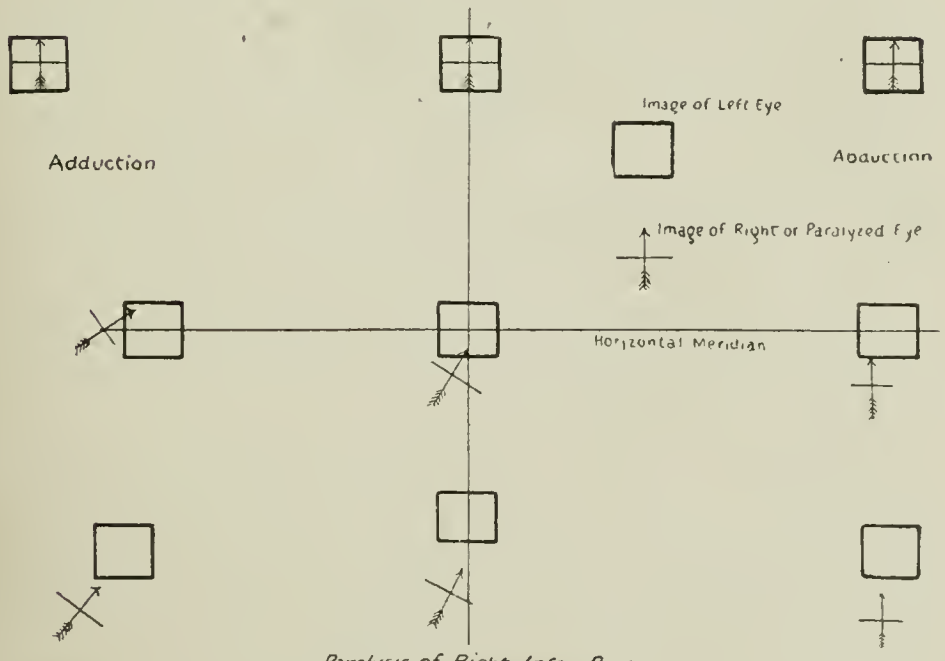
The physiologic origin of the superior oblique is the trochlea, its point of insertion lies in the vertical meridian, back of the equator; that means, the point of insertion lies in a lower plane than the trochlea, and back of the center of motion.

Since the point of insertion is lower than the point of origin and behind the equator, when the muscle contracts the posterior half of the eyeball is drawn upward, i. e., the anterior half is drawn downward and inasmuch as the point of insertion lies outward from the point of origin, the muscle must draw the posterior half of the eye inward, i. e., the anterior half outward and the upper end of the vertical axis inward.

Physiologically, we can not think of the superior oblique as a muscle merely pulling the eye down and out, but we must think of it as consisting of three component parts, each one of which has its own characteristic action in different positions of the eye.



Paralysis of Right Sup. Oblique.



Paralysis of Right Infer. Rectus.

1. The abducting action.
2. The lowering action.
3. The rolling action, tilting the vertical axis inward.

When the eye is abducted, the abducting and tilting action of the muscle comes into play, while the lowering action is almost entirely in abeyance; when the eye is adducted, the muscle has but very small abducting power, while the lowering function assumes the greatest prominence.

If we bear these facts in mind, this chart illustrating the diplopia, which exists in various parts of the field in paralysis of the superior oblique of the right eye at once becomes clear. There is single vision in the upper part of the field; in the horizontal portion of the field, providing there has been no latent muscular disturbance previous to the paralysis, there is homonymous diplopia, the false image being downward and outward and tilted toward that of the fixing eye. As we go downward when the eye is adducted, the vertical distance between the images becomes greater. Here the lowering action of muscle is greatest. Toward the right, the lowering action of the muscle diminishes, and the abducting and rotating power becomes more marked, and when we come to a position of extreme abduction, the lowering function of the muscle has almost entirely gone into abeyance while the rotation and lateral displacement of the images is very marked.

In other words, in paralysis of the superior oblique, the vertical distance between the images is most marked, when the eyes are directed downward and inward. As the eyes are abducted, the vertical displacement diminishes, while the lateral displacement and obliquity of the false image becomes greater.

The inferior rectus does not run backward parallel to the sagittal axis of the eye, but takes a course slightly inward, therefore, it not only lowers the eye, but also adducts it and tilts the upper end of the vertical meridian outward.

This muscle also, therefore, has a triple function variously exercised as the eye assumes different positions.

With this muscle, however, the lowering function is most marked, when the eye is abducted, while the ad-

ducting and tilting power becomes greatest as the eye moves inward.

The chart, therefore, shows diplopia most marked in lower portion of the field, and provided there were no latent muscular inequalities previous to the paralysis, the diplopia is crossed, and the upper end of the false image tilted toward the image of the good eye. As the eye is abducted, the vertical distance between the two images increases, while the lateral displacement and tilting disappears, and vice versa as the eye is adducted the adducting power of the muscle comes to the front, while the lowering power diminishes, so that, as the muscle moves inward toward the median line, the difference in height between the images becomes very much less, while the lateral displacement becomes greater.

If we bear in mind these facts, the reasons for Mauthner's schema becomes manifest.

Let us assume, e. g., that we have a paralysis of a depressor, and wish to make a differential diagnosis as to which depressor is paralyzed. We find that the greatest difference in height between the images is downward, and to the right. Furthermore, we find the lower of the two images belongs to the right eye; this at once shows us that the paralyzed muscle must be either the right inferior rectus or the right superior oblique, but we have just found that the greatest difference in height between the images, is downward and to the right, i. e., when the eye is lowered and abducted, therefore the paralyzed muscle must be the inferior rectus, it could not be the superior oblique, because, as we have just seen in positions of abduction, in paralysis of the superior oblique, the vertical distance between the images disappears, while here it is greatest in this position, therefore, the paralyzed muscle must be the inferior rectus.

Why is this schema superior to those so often advocated, where the differential diagnosis is made in the following manner? Supposing a depressor is paralyzed, if the images are homonymous, and the false image is displaced downward and outward, they say it must be a paralysis of the superior oblique; if the images are crossed, and the false image is displaced downward and inward, it must be paralysis of the inferior rectus. All diagnoses,

which are based upon the fact, whether the images are homonymous or heteronymous are very apt to be shaky, because they don't take one very important thing into consideration. Where a latent divergence exists in paralysis of a superior oblique, when the muscle becomes paralyzed the incentive to fusion disappears and the divergence is no longer latent; then instead of an homonymous diplopia we would have a crossed diplopia, or if a latent convergence exists when an inferior rectus becomes paralyzed, instead of a crossed diplopia we would have an homonymous one, and when we reflect how commonly either a lateral divergence or convergence is present, we at once see how unreliable that method of diagnosing a depressor or elevator is, which depends for its differential diagnosing on the fact whether a diplopia is homonymous or heteronymous. Differential diagnosis between elevators of the eye, is much simplified, if we bear one fact in mind, and that is that isolated paralyses of the inferior oblique do not exist, at least none has ever been recorded; where an isolated paralysis of an elevator exists, we can almost certainly assume that elevator to be a superior rectus, and it is only when all the muscles enervated by the third nerve are involved, that we need to take the inferior oblique into account.

In closing, I should just like to call your attention to one symptom, which I think very valuable in diagnosing a paralyzed muscle at times, and which most text books do not mention, and that is the secondary deviation of the sound eye, when the paralyzed eye fixes, a symptom especially useful in differentiation between paralysis of an inferior rectus and superior oblique.

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THE TOXIC AMBLYOPIAS.*

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These anatomico-pathologic researches relate to quinin amblyopia, to filicic amblyopia (by absorption of the extract of filix mas) and also to alcohol-tobacco amblyopia. Some ideas thus acquired can be extended to optic neuritis in general.

A. *Quinin (and Cinchona) Amblyopia.*

My experimental researches on quinin amblyopia are absolutely confirmatory of the results obtained by Ward A. Holden.† I have produced amblyopia in dogs, as he has, by hypodermic injections of a soluble salt of quinin. With the aid of the Marchi staining method, he found that, at the commencement of the affection, the nerve fibres present no alteration. Toward the 17th day only was there a commencing degeneration of the fibres which was complete toward the 42nd day. On the other hand, the Nissl method revealed from the onset of the amblyopia some chromolysis (partial dissolution of the granules of chromatin) of the nerve cells of the retina with dilatation (edematous) of the pericellular spaces, vacuolation and commencing disorganization of the ganglion cells. The cellular changes are first in order and are followed by

*An abstract of a report on "Toxic Inflammation of the Optic Nerve" presented to the Section of Ophthalmogy of the XIII International Congress, in Paris, 1900.

†Ward A. Holden, Archives of Ophthalmology, Nov., 1898.

the disappearance of the cells. The vessels of the retina and optic nerve remain normal for a week or longer.

In a case of quinin blindness (in the dog) of 24 hours duration at most, we were able to confirm the chromolysis of the nerve cells; it was even more pronounced than Holden described it. The optic nerve was normal. We even found a very appreciable degree of chromolysis of these same cells in an eye which was not blind, but presented an appreciable degree of dilatation of the pupil after four injections of quinin. Since then identical observations have been made by Drusault* and by Hirschfeld.‡

Holden is right in recognizing in the chromolysis of the nerve cells of the retina the first manifestation of quinin intoxication in the visual nervous apparatus, and in considering the later changes in the optic nerve as secondary; consecutive to the lesion in the retinal nerve cells, De Schweinitz has described these lesions of the optic nerve, in a dog blind for two months; from the eye to the nerve centres there was in places atrophy and hypertrophy of the nerve fibres, dilatation of the peri-vascular lymph spaces, thickening of the walls of the vessels and obstructive endo-vasculitis and thrombosis

We shall see further on that these latter changes are reproduced exactly and in the same chronological order after simple optico-neurotomy, or after traumatic destruction of the retina.

The first and only change in the visual nervous apparatus, in quinin amblyopia then, is chromolysis of the retinal nerve cells. This progresses and the nerve cells are destroyed. The changes in the optic nerve are consecutive to those in the cells. The starting point of quinin amblyopia is in the retina. The other retinal layers are only altered slightly, and after some weeks.

Admitting, however, that we have gained this knowledge, chromolysis is not in itself a grave change, nor destructive of the cells. It seems, therefore, that quinin intoxication causes in them still another change, the nature of which is unknown, but which results in their des-

*Drusault: Pathologenie de l'amaurosis quinique, Paris, 1900.

‡Birsch-Hirschfeld: Archives of Ophthalmology, 1900.

truction; chromolysis is only an epiphenomenon, a symptom, so to say.

The mechanism by which the poison produces this cellular alteration is usually looked for in retinal anemia, the ophthalmoscope showing in these cases a very marked constriction of the central vessels. There remain, nevertheless, more obscure points than one in the anemic theory, and it has not been proved that quinin does not exert a harmful influence upon the nerve cells themselves.

B. *Filicic Amblyopia.*

In order to fully appreciate the lesions of filicic amblyopia or amaurosis, a few preliminary words on the normal structure of the optic nerve and of the degeneration produced in the retina and optic nerve by section of the latter are necessary.

Normal Structure of the Optic Nerve.

We wish to remark in the first place that until recently too much importance has been attributed to the connective tissue of the optic nerve at the expense of the neuroglia, both from the standpoint of normal, as well as of pathological anatomy.

In a transverse section of the nerve the interfascicular connective tissue septa are usually figured in the form of complete polygons closely surrounding the bundles of nerve fibres on all sides. Moreover, these septa are made continuous with the connective tissue bands, penetrating and ramifying in the bundles. That these are profound errors can be shown by the aid of the Van Giesen method which stains the connective tissue, including the walls of the vessels, a bright purple, staining also, but very slightly, the nerve fibres, and to a great extent the neuroglia, in yellow. The interfascicular septa are composed exclusively of neuroglia. Moreover, the connective tissue part of the septum is lined on each of its two surfaces by a layer of neuroglia continuous with the interfasicular neuroglia. The interfascicular bands of connective tissue (of some authors) are nothing but compact bands of neuroglia, capilliaries, with very little connective tissue, or even none at all, penetrating between the bundles with

extreme rarity. In short, the fascicular mass is composed exclusively of nerve fibres and of neuroglia. As for the more intimate structure of the neuroglia of the optic nerve, it resembles absolutely that of other nerves of ectodermic origin (Cajal). It is composed of fibres and cells, the latter with little protoplasm; almost naked nu-

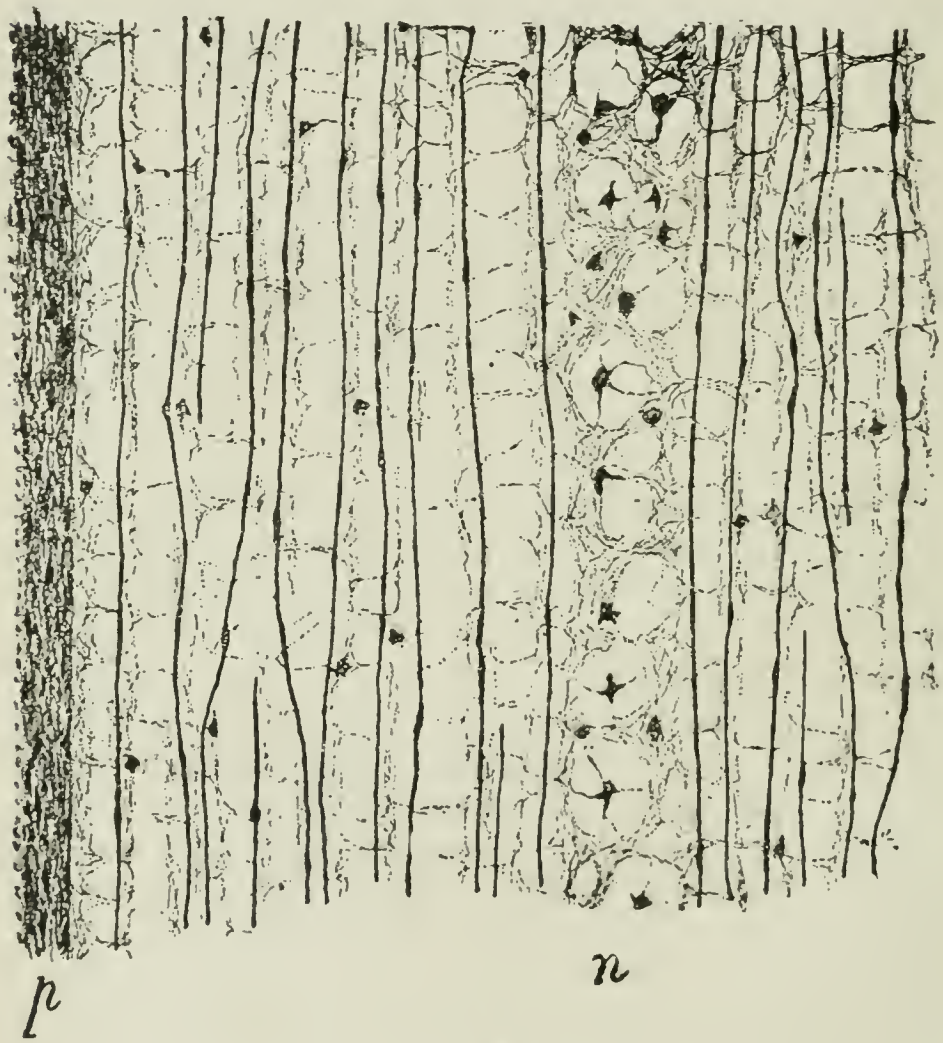


Fig. 1.

Longitudinal section of the optic nerve in a case of commencing retro-bulbar neuritis in man.

clei, as Weigert has demonstrated. The fibres arise neither from the nuclei nor from the protoplasm of the cells. They constitute a network within which the somewhat rare nuclei are situated. The fibres run to the surface of the cells without terminating in them. The so-called spider cells, demonstrated by the Golgi method,

have no real existence. This is not a proper method for the study of the details of structure (Weigert). This only disproves, however, the fibres being continuations of the cells.

The part represented is from the vicinity of the focus of the nerve inflammation. The inflammatory edema has distended the neuroglia sheaths of the nerve fibres. The vertical black lines represent the axis cylinders stained with fuchsin; *p*, pial sheath of the nerve; *n*, band in the line of which the neuroglia is more condensed. It includes numerous neuroglia nuclei, in part enclosed in the lacunæ distended by edema.

The neuroglia constitutes a kind of very incomplete sheath for each nerve fibre. Fig. 1 represents the details. It is a longitudinal section of an edematous peripheral bundle (in man) taken in the neighborhood of a neuritic spot. The neuroglia sheaths are distended by edema (collateral). The black vertical lines are axis cylinders stained by fuchsin. Beneath the pial sheath *(p)* of the nerve, there is a layer of neuroglia which is continuous with the sheaths of the nerve fibres. In *(n)* there is a thickened longitudinal band of neuroglia with numerous nuclei. These neuroglia nuclei are uncommon in the rest of the tissue.

Degeneration Consecutive to Section of the Optic Nerve.

The optic nerve must be divided behind the point of entrance of the central vessels in such a manner as to preserve the circulation intact. It is an easy matter with the rabbit. No one has yet studied by aid of the Nissl method the retinal changes consecutive to such a section. The various authors who have made this study by methods which do not reveal all the primary cellular lesions (Krenchel, Rosow, Wagenmann, Hertel, etc.) have found the cells intact after one, two or three months and even after a year.

We have found as early as the third day after neurotomy some chromolysis of the retinal nerve cells. The chromolysis is progressive and, from the twelfth day on, it is complete. From the 20th to the 25th day, the nerve cells have totally disappeared. Since our first publication,

these results have been confirmed by Birsch-Herschfeld,* at least so far as chromolysis is concerned.

As to the alterations in the nerve, it is necessary to distinguish between the neighborhood of the section and the apex of the orbit. Opposite the section, traumatic changes are very soon produced, upon which we shall not lay any stress here.

At the apex of the orbit the condition is one of true secondary degeneration from the 20th day. The nerve fibres are much altered (Marchi method). They disappear completely only after 1 1-2 or two months. Hyperplasia of the neuroglia also at the apex of the orbit comes on only with the alterations in the fibres. Interstitial edema occurs, the vessels become thickened, the endothelium proliferates and finally the connective tissue septa hypertrophy.

As we have said, these preliminary remarks are necessary in order to understand the changes which take place in filicic amblyopia.

In 1895 *Masius and Mannheim*† found in filicic amaurosis in the dog, an atrophy of the optic nerve, which was according to them the result of interstitial neuritis. The connective tissue and the hypertrophied vessels compressed the nerve fibres and caused them to atrophy. A fact is here reproduced which has been already established for quinin amblyopia. Masius and Mannheim formed their opinion from the examination of these old cases (one and two months).

Our investigations have been made on 20 dogs made blind or very amblyopic by the internal administration by the mouth of capsules of the ethereal extract of male fern.

The blindness, always bilateral, comes on abruptly from one day to the next. Most frequently it is complete, even permanent. Some vision, however, may return and sometimes recovery appears to be complete. The pupil is dilated ad maximum and is motionless. On the second day, an appreciable degree of lagophthalmus supervenes, due to the eye being pushed forward by the swollen and stiff-

*Birsch-Herschfeld: l o. cit.

†Masius and Mannheim: Bull Acad. Roy. Acad., Belgium, 1895, p. 911, et 1898.

ened (straightened) optic nerve. This symptom, which was present in the two cases which it has fallen to our lot to observe in man, disappears later with the swelling of the nerve.

At the commencement, the optic papila is pale. Later it may develop the ophthalmoscopic symptoms of optic nerve atrophy. In two such cases in man, we have seen from the onset a capillary anemia of the papilla, passing on finally to atrophy. The initial anemia is not always as pronounced as in quinin amblyopia. At the autopsy the optic nerve is during the first day swollen and hard to the touch. It becomes straight in the orbit and pushes the eye forward—hence the lagophthalmus. Later the swelling and induration diminish: at the end of two months the nerve has become almost threadlike.

MICROSCOPIC EXAMINATION OF THE NERVES.

The optic nerve is profoundly diseased from the commencement of the amaurosis or amblyopia. The changes commence at the eye, then appear along the nerve up to the chiasm, and later on in the optic tract. The most striking changes are those of the nerve fibres. In the worst cases, all the nerve fibres are altered from the onset (according to Weigert-Pal method). In others, some bundles of fibres withstand the distention process a longer time. When the attack is very severe, all the nerve fibres behind the eye, absolutely all, may have entirely disappeared after the lapse of three days. This rapid melting away of so large a mass of nerve fibres is certainly a very remarkable phenomenon, without an example among the other forms of non-infectious neuritis. The absence of the white substance of Schwann from the fibres of the optic nerve seems to make this possible.

Figure 2—a longitudinal section of such a nerve and Figure 3, a transverse section give an idea of these initial changes. In Figure 3, there still remain some normal fibres. At (a) there are some irregularities (stained by the Weigert-Pal method): the first stage of the change.

To sum up, the nerve fibre changes rapidly and is absorbed while the neuroglia alveolus which contains it becomes distended by interstitial, clear, watery edema.

The axis cylinder seems to withstand the process no longer than myeline. It dissolves and disappears.

The nerve fibres have disappeared before the neuroglia sheaths which contain them are much enlarged. The interstitial edema increases forthwith and distends these sheaths more and more; sometimes enormously (2 & 3). In some of these distended alveoli a homogenous mass

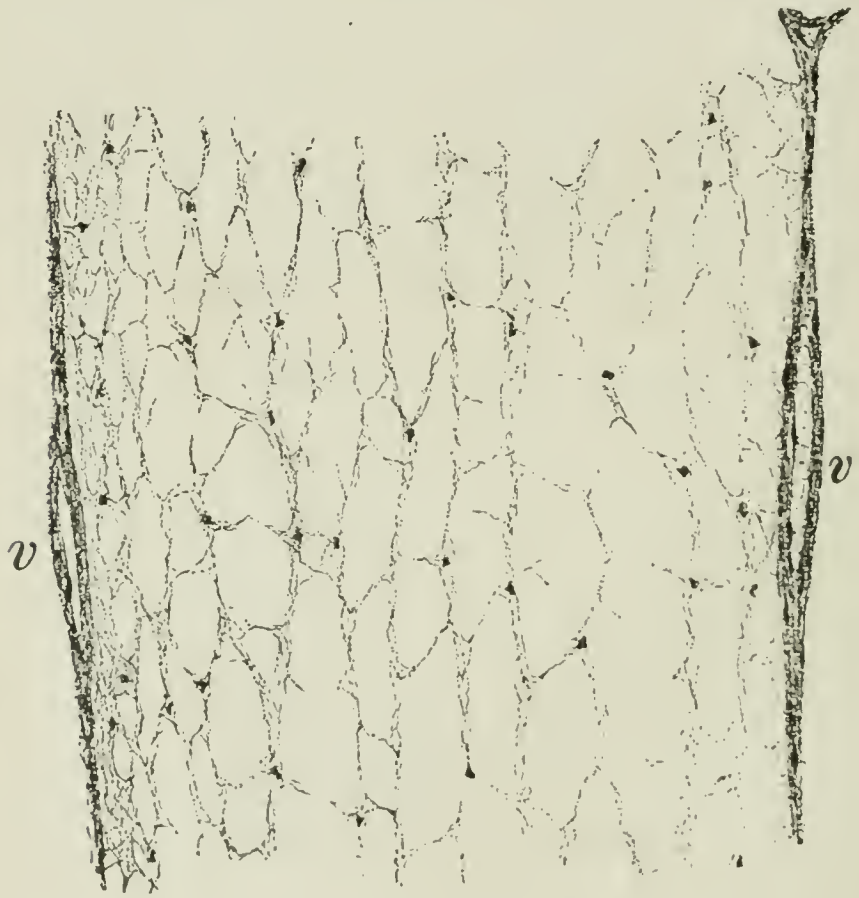


Fig. 2.

Longitudinal section of the optic nerve (of the dog) at the commencement of filicie neuritis: V and v are blood vessels. The nerve fibres have completely disappeared. The neuroglia, not yet hypertrophied, is distinctly isolated. The neuroglia sheaths are distended by edema. The distention is here least marked next to the vessels.

can then be seen, no longer staining by the Weigert-Pal method but giving the re-action of hyaline material. The edema accumulates also around the vessels, separating completely the connective tissue portion of the septa from the neuroglia portion. The former remains with the vessel; the latter follows the general neuroglia mass of

the fasiculi. Fig. 3 shows the commencement of this perivascular edema. The interspace filled with clear fluid becomes complete and the blood vessel with its surrounding connective tissue can be completely separated over a great extent from the neuroglia tissue by a perivascular space. This separation of the neuroglia from the connective tissue of the septa shows that the connection between them is less intimate than preparations of the normal nerve would lead us to suppose. It clearly appears, also, that the supposed intravascular prolongations of connective tissue are really neuroglia. The perivascular spaces may also be filled with a hyaline substance, as indicated above.

At the commencement of these changes the vessels are absolutely normal as regards the thickness of their walls, their nucleation and their endothelium. Soon, however, the walls become moderately swollen. Only at a later stage, when neuroglia vegetations are produced, does the nucleation in the vascular walls increase; endovasculitis supervening.

There is no appreciable trace of leucocytal emigration, which also scarcely occurs during the progess of the condition except during the necrobiotic softening of the neuroglia (see later). The nerve sheaths in the meantime are normal; the spaces which they surround are obliterated as the result of the swelling of the nerve itself. This swelling is exclusively due to edema of the nerve substance. This fact seems to show that the lymph in the interstices of the nerve itself does not pass into the vaginal space. It should pass normally along the nerve up into the cranial cavity.

But what happens in the meantime in the region of the papilla? The non-medullated fibres in this region resist change for a longer time (one week) than the medullated fibres around the lamina cribrosa. At the onset the papilla is swollen very little, or not at all. After a couple of days, slight swelling supervenes, due to the diffuse edema. In many cases, probably of violent onset (not in all), this swelling presents for a fortnight exactly the appearance of a choked disc. The head of the papilla projects toward the vitreous body like a mushroom and the lamina cribrosa (normally a little convex posteriorly)

presents a decided convexity toward the vitreous. At a later stage, this "papillitis" gives way to an atrophic ex-

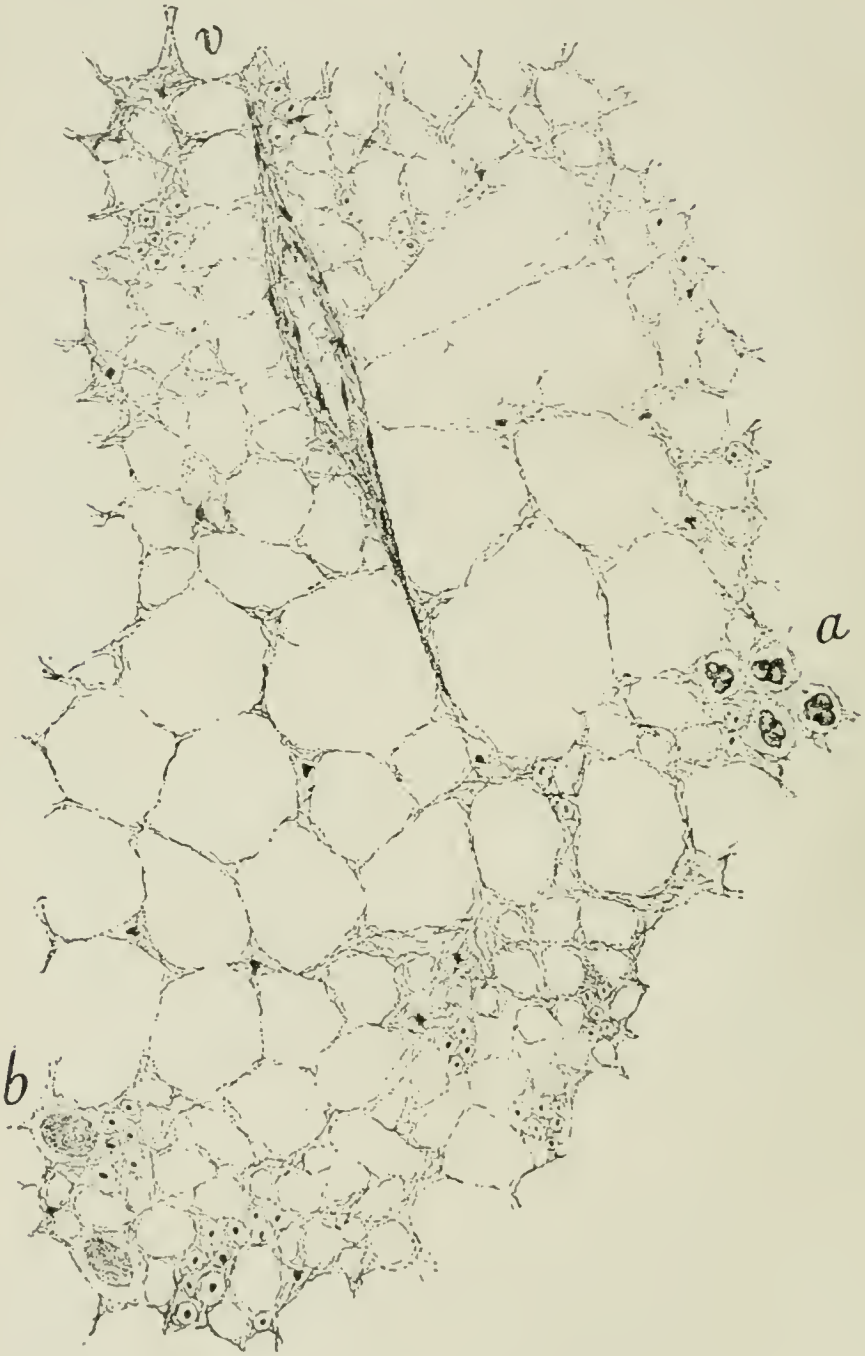


Fig. 3.

Transverse section of the optic nerve (in the dog) at the commencement of the filicic neuritis. The normal nerve fibres still remain here and there: the greater part have disappeared. (c) altered nerve fibres: (b) hyaline substance filling the alveoli: (v) blood vessels in process of becoming surrounded by perivascular spaces.

cavation of the papilla. Let us note, in passing, that

this edema of the papilla is caused by a parenchymatous neuritis—for such is the process with which we are concerned—without a trace of dropsy of the intravaginal spaces of the nerve sheaths. It constitutes a distinct argument in favor of the opinion (Parinaud) which denies a dominant importance to dropsy of the nerve sheaths in the production of choked disc in intracranial affections.

Let us dwell then for a moment on the interstitial changes in the nerve; on the destruction and rapid dissolution of the nerve fibres and the accompanying edema. This edema, we have stated, is appreciable from the first changes in the fibres. It is still more pronounced during the course of the affection. But is it the cause or the effect of the alteration in the nerve fibres? The alteration in the latter may be the primary condition: the result, for example, of a poisonous action exerted by filicic acid on them. On the other hand, it is in conformity with prevailing ideas that so rapid a disorganizatien of a number of nerve fibres should give rise to toxalbuminous and phlogogenic substances, which, while acting on the vessels, excite a copius exudation of plasma, or diffused serous exudation, which becomes interstitial. It is worthy of remark here that the edema is not accompanied by the emigration of leucocytes which takes place in the other organs. We must not forget either that so rapid a disorganization of a large number of nerve fibres, would withdraw by the new osmotic conditions alone, from the otherwise normal vessels a quantity of liquid plasma by a purely mechanical process.

But we may also look upon the edema as an initial condition, destroying the nerve fibres by its mere presence. We doubt, however, if we can bring ourselves to this way of thinking. In the first place, it would be necessary to explain the genesis of this edema in the absence of changes in the blood vessels (the optic nerve fibres being presumably intact).

What especially argues against the hypothesis of the edema being the initial cause of the changes in the nerve fibres is that in simple edema caused by lymph stasis (choked disc) in case of cerebral tumor and even in albuminuric neuro-retinitis the fibres often remain unaffected for several months.

The anemic theory advocated with some show of probability in quinin amblyopia is not applicable, because at the beginning of filicic amblyopia, anemia is but slightly marked.

It is absolutely necessary, therefore, to assume a primary lesion of the nerve fibres. That does not prevent the edema, a supposed secondary product, from being in its turn an effective cause of the dissolution of the fibres already changed and diminished in vitality. And this is the more probable because, in contrast with the fibres of other nerves, these lack the protective sheath of Schwann.

In any case, we cannot invoke, for the purpose of explaining the disappearance of the nerve fibres, a constriction exerted upon them by the vessels and hypertrophied connective tissue, since at the commencement the latter are normal, being at a later period separated by edema from the neuroglia mass, and becoming hypertrophied only a long time after the disappearance of the nerve fibres. The change in the optic nerve in filicic amblyopia is not only a retro-bulbar neuritis, but a parenchymatous neuritis consisting of a primary lesion of the nerve fibres. The changes in the interstitial tissues are certainly secondary.

CHANGES (SECONDARY) IN THE NEUROGLIA, CONNECTIVE TISSUE AND VESSELS.

After the disappearance of the nerve fibres, the neuroglia remains completely isolated under conditions eminently favorable for the study of this element of the optic nerve.

The fascicular spaces are exclusively occupied, all of those figured as a matter of fact, by the neuroglia with occasional intrafascicular capillaries and traces of the connective tissue surrounding them. At the onset and for several days later, the neuroglia is not changed except as its fibres are elongated and distended by interstitial edema. Fig. 2 notably and Fig. 3 give a good idea of it. Fig. 4, drawn with greater enlargement, shows at (b) in the form of points or dots, transverse sections of the neuroglia fibres. The occasional nuclei, mainly, normal, some

more rounded, the majority angular, are placed by preferance at the nodes through which the fibres pass. When one examines under still higher power, one becomes convinced that the fibres pass at the side of these nuclei and are not prolongations of them. The projecting angles of the nuclei are directed toward the fibrillar bundles which proceed from the nodes.



Fig. 4.

Meshes of neuroglia highly maginfied. We see four nuclei at the nodes of the neuroglia network. Indications of cellular protoplasm surrounding these nuclei. The fibrils of neuroglia pass without interruption to the surface of the protoplasm. At (b) some dots represent neuroglia fibres cut more or less transversely.

Soon the nuclei swell a little and to this swelling the modifications which take place in the neuroglia seem to be limited for some days.

Toward the 5th day, the neuroglia evidently begins to proliferate as much in its fibres as in its cells! The meshes surrounding the alveoli become richer in fibres (Fig. 5 at a). At the same time the alveoli tend to become

equal; the larger ones shrinking at least in part. This is due to a diminution of the edema; the tension of the

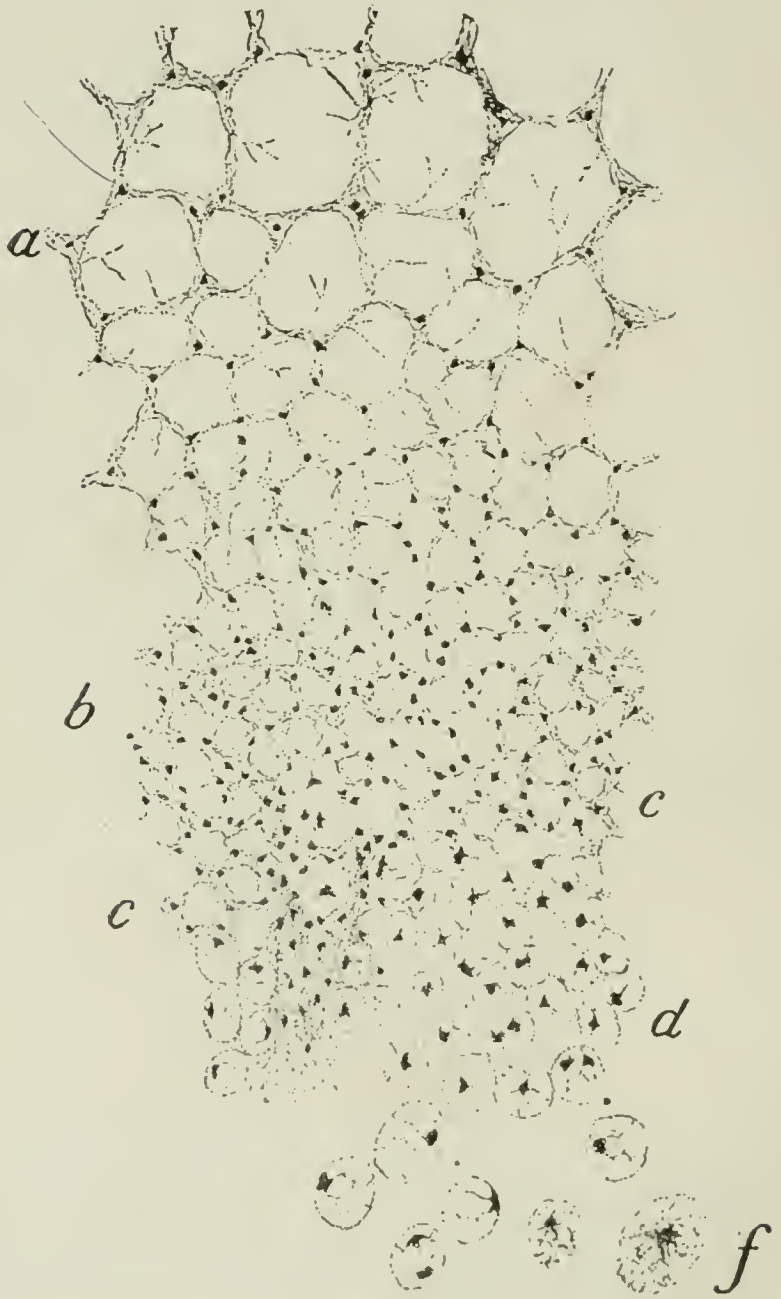


Fig. 5.

Hypertrophy and softening of the neuroglia by the development of epithelioid cells. a, A zone in which hypertrophy has already commenced; from b to c, zone in which this hypertrophy attains its maximum; c, the formation of epithelioid cells commences, which at d, is at its height; f, two epithelioid cells on the point of disintegration.

nerve becoming lower. In the meantime, the nuclei of the neuroglia increase in numbers, still grouping them-

selves at the points of crossing of the fibres (Fig. 5 at a). The tissue thus shrinks, newly formed fibres make their appearance and the alveoli become smaller and smaller without, however, becoming completely obliterated. The nuclei of the neuroglia, always characterized by their angular shape and by their grouping, increase in numbers (Fig. 5 at b). At first sight it would appear that a dense emigration of leucocytes had taken place, but nothing of the kind occurs. All these nuclei are derived from the neuroglia.



Fig. 6.

Softening of the Neuroglia by Epithelioid Cells. Fig. 5 shows at (d) this method of softening.

An actual softening of the neuroglia now supervenes and that in two or three different ways, according to the case and according to the part of the nerve; a, by the production of epithelioid cells; b, by the production of small cells; c, by necrobiosis.

In a general way, the small cells of the neuroglia largely increase in numbers, acquire considerable dimensions, become large, clear, cellular bodies, the nuclei remaining small and angular; they deserve the name of "epithelioid cells." The fibres of the neuroglia, also much increased in numbers, disappear at the same time with great rapidity and without leaving a trace. All the space is occupied by

epithelioid cells which even become polyhedral by mutual pressure. In the zone in which these cells are formed, one cell may be seen occupying completely and filling a still intact alveolus.

Fig. 6 shows these epithelioid cells under a higher power than that of Fig. 5. Most frequently there is a single nucleus for each cell. We may find two of them, rarely more—an indication of the multiplication of the epithelioid cells. Judging from observations made (by other authors) on analogous cells in the central nervous system, division of the cells takes place, and it must be of the indirect type. A good number of the always very angular nuclei are placed eccentrically, often, indeed, quite against the cell wall.

The body of the cell is well defined, but without a cell wall. It is transparent and characterized by a curious network which is very constant and is formed of the anastomoses of the filaments coming from the apex of each projecting point of the nucleus. Fig. 6 only shows the coarser parts of this network. We are inclined to think that these filaments are not really inserted into the nucleus, but that they simply pass over its surface. It is even probable that the anastomoses themselves are only apparent. These fibrils are newly formed neuroglia fibres in the cell protoplasm, but not perfectly elongated and separated as under normal conditions. Instead of extending to distant points and intermingling with the processes of neighboring cells, they remain aggregated in a kind of cellular mass which in its greater part is certainly not of a protoplasmic nature. In this way, particularly, the eccentric situation of the nucleus in a good number of cells is explained.

The epithelioid cells are destined to disappear. They become granular, eroded at the periphery (Fig. 5, f and Fig. 6, a) and disappear. After the absorption, larger or smaller cavities remain in the nerve filled with a transparent liquid and traversed by large altered blood vessels.

The nerve may be thus transformed over a great extent into a hollow tube, the wall of which is formed by the pial sheath a little thickened, folded like a mantle, sometimes very thin, with sclerosed neuroglia and altered blood vessels. Toward the end of the second month or later,

that cavity has smooth walls formed by fibrillar gliosis (see later) with altered vessels and fibrillar connective tissue. Lining the walls of the cavities, particularly in the irregularities of the surface, some epithelioid cells are still found, indeed often a simple but imperfect pavement epithelium. At other points or in other nerves, the softening does not tend to the formation of large cavities, but occurs in spaces separated by lamínæ of neuro-neuroglia tissue, including the vessels. Moreover, the large cavities are those most frequently traversed by greatly altered blood vessels.

The softening may at last attack the peripheral fasciculi and then it does not tend any longer to the formation of large cavities.

In the foci of softening, the vessels are always much changed. The walls thickened and hypernucleated, with endovasculitis; the endothelial cells vegetating and obstructing the lumen of the vessels more or less. There is also a new formation of capillary vessels. The connective tissue surrounding the vessels becomes uniformly hypertrophied. The epithelioid cells, which we have just described, seem to be identically the same as those described by Hayem* in certain forms of traumatic encephalitis and which Friedmann† has studied, following traumatic non-infectious encephalitis. In the infectious forms of encephalitis, Friedmann has found no traces of them. The same cells are formed, according to Boedeker and Juliusburger‡, in the middle of the lateral column of the cord in the spinal affection of pernicious anemia. Widmark§ has described them in retinal glioma. Observers who have found them in the central nervous system always dispute as to their origin. According to Friedmann, they are of multiple origin and are derived from all of the cells of the nervous system; from those of the neuroglia; from nerve cells; from those of the connective tissue and the blood vessels, even indeed, from the migratory cells.

*Hayem, Etude sur les diverses formes d'encephalite, Paris, 1868.

†Friedmann, Arch. f Psychiatrie u. Nervenkrankh, 1890, t. XXI, p. 837 et.

‡Boedeker et Juliusburger, Ibid, 1898, t. 29, p. 376.

§Weidmark Beitr. z. Ophtalm. Leipzig, 1891, p. 285.

We cannot find a more favorable subject than the optic nerve for the purpose of elucidating this question of their

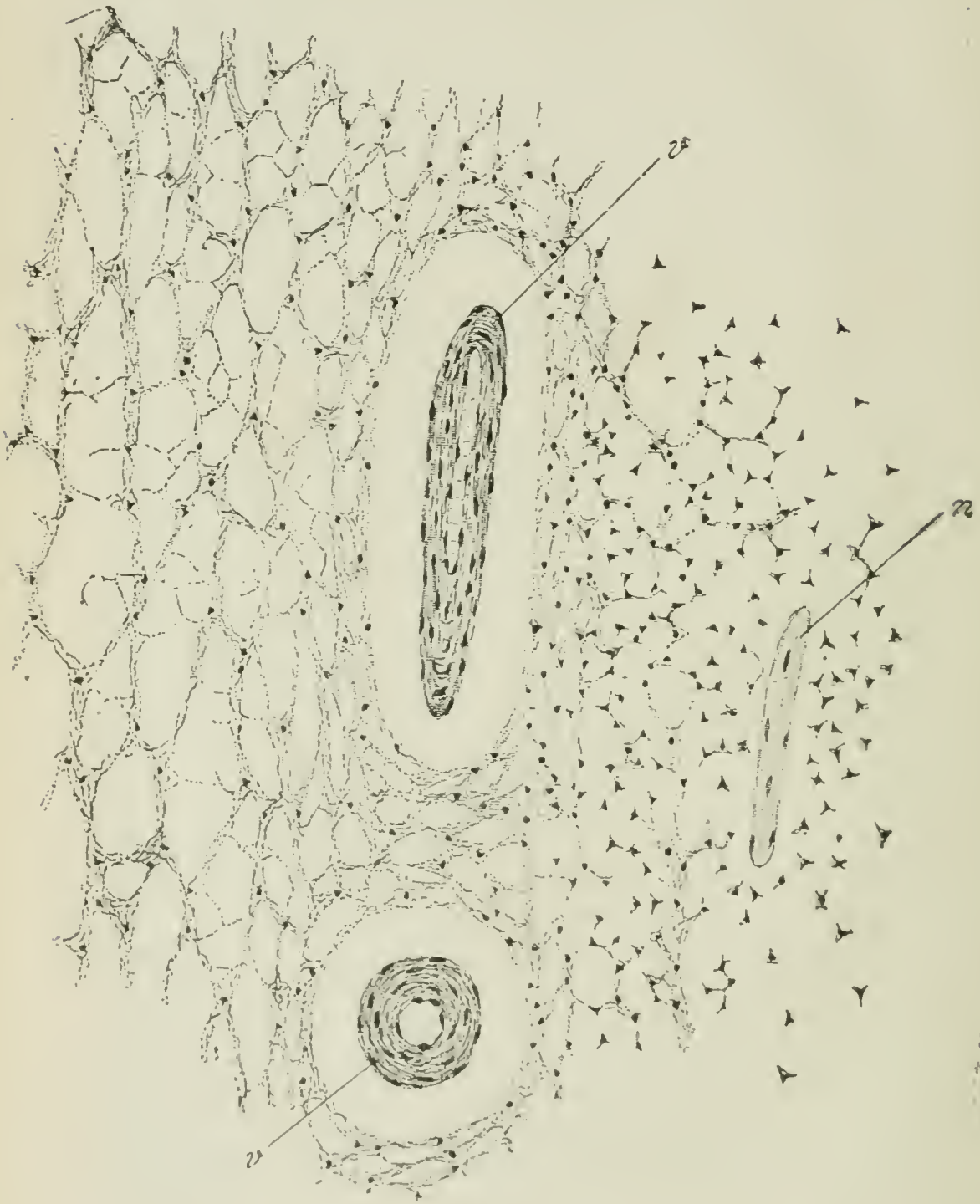


Fig. 7.

Softening by Formation of Small Cells.

origin. Not the smallest doubt remains that, in filicic neuritis, absolutely all of them are changed neuroglia cells.

These epithelioid cells certainly play the part of macrophagic cells of Mettschnikof. The bodies of the neuroglia cells swell rapidly while the bands of fibres disappear; the latter probably being all dissolved and absorbed by the former. The cells then digest themselves. They thus dissolve all the neuroglia and render it soluble.

In other organs, the macrophagic cells are derived from connective tissue cells (endothelial, etc). Here they are derived from the cells of the neuroglia.

Softening by formation of small cells. In Fig. 7, a transverse section of the nerve on the 12th day, *v* and *v* are blood vessels with much thickened walls, separated from the neuroglia mass by perivascular edema; *n*, is a necrosed capillary situated in the centre of the softened area. At the left in the figure, the neuroglia network is in process

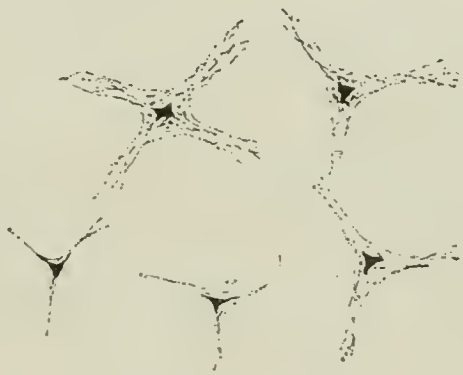


Fig. 8.

of becoming hypertrophied, with nuclei already appreciably increased in number. On the right, the nuclei of the neuroglia have already undergone a multiplication. Finally the neuroglia has become softened, but in such a manner as to isolate completely every cell, with some tags of fibrils. Fig. 8 represents these cells under a higher power. The cells thus isolated appear to live on for some time and to become very appreciably increased in numbers. Briefly, it is another mode of softening in which the cells do not assume an epithelioid appearance. It is met with in many nerves side by side with softening by formation of epithelioid cells.

Necrobiotic softening of the neuroglia. In other regions, the neuroglia softens more directly without preliminary, or after very slightly marked, hypertrophy. Fig. 9 is an example. The neuroglia is here in process of being dis-

solved. Fragments of it remain, representing especially the crossing points of the network enclosing some nuclei and fragments of the fibrillar meshes and blood vessels which, being more resistant, still remain, but are much altered. They are surrounded by spaces—remains of the perivascular spaces. This form of softening has all the characters of a necrosis and fully deserves the name which we have given to it. We often find that it borders on the form of softening by formation of small cells. We may

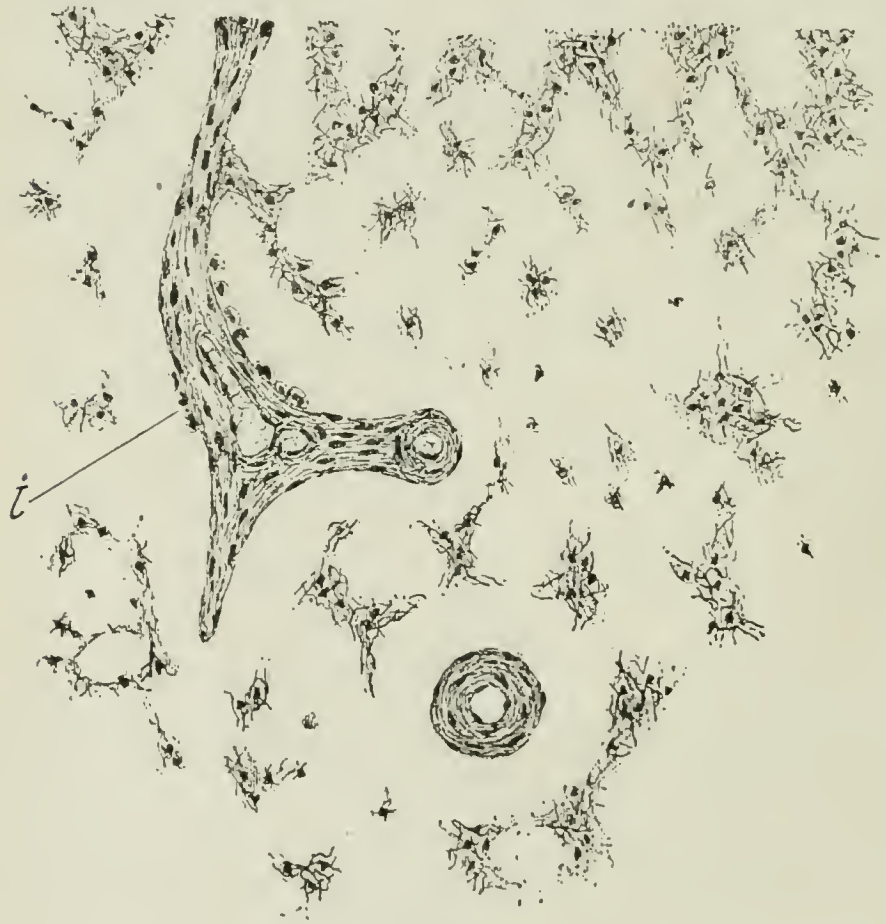


Fig. 9.

group these two last forms of softening in a single category. However, in that characterized by the production of numerous small cells, necrosis is less pronounced; and the isolated cells still continue to increase in numbers. At *i* (Fig. 9) we see on both sides of the vessel migrated leucocytes recognizable by their distinct protoplasmic body, and their indented, but not angular nuclei. It is the only stage of the process in which we have seen a well-marked emigration of leucocytes. This is, however,

slight and in strong contrast with the copious emigration of leucocytes which occurs on the same level from the vessels of the pial sheath; the leucocytes being discharged into the subarachnoid space of the nerve.

When all three forms of softening co-exist in the same nerve, the form plainly necrobiotic is usually found near the eye, where the process is most violent. At a point nearer the apex of the orbit, we meet with the form with small cells; and still nearer, that with large cells. The vessels undergo their maximum changes in the necrobiotic form. They are least changed in that characterized by epithelioid cells.

Sclerosis of the Neuroglia or Fibrillar Gliosis. In all these nerves, we find fibrillar fasciculi, around the areas of softening, for example, also in the optic foramen (and here often involving the whole thickness of the nerve) in which the hypertrophy of the neuroglia does not tend toward softening, but toward new formation and definite and permanent condensation, especially of the neuroglia fibres; the nuclei being rather scarce. These newly formed fibres are all arranged longitudinally, becoming firmly pressed together. They often acquire exaggerated dimensions; become flattened and may simulate connective tissue fibres. They seem, indeed, to have been often mistaken for axis cylinders in other types of neuritis. It is a true fibrillar gliosis of the optic nerve and seems to be produced in certain forms of parenchymatous neuritis of the optic nerve, notably in tabetic atrophy.

Longitudinal Changes in the Nerve, in the Optic Foramen, Optic Tracts, etc.

We have already said that the nerve fibres in the papilla withstand change for a longer period of time than those behind the eye, and moreover, that at the optic foramen, these changes are produced still later than in the eye. At the beginning of the process, the nerve fibres may be intact in the foramen, as also in the neighboring interstitial part of the nerve, while they are much injured and even destroyed in the eye.

After 5 or 10 days, the conditions tend to be reversed. We may find that in the optic foramen the nerve fibres

are more changed than in the neighboring part of the orbit. The process progresses more quickly.

At first the interstitial edema does not distend the neuroglia sheaths as much here as elsewhere, which seems due to the fact that the bony canal prevents mechanically much swelling of the edematous tissue. But it is the more interesting to note that at this same point the perivascular (or rather peri-septal) edema is generally more pronounced than elsewhere and separates the septa more completely from the neuroglia tissue.

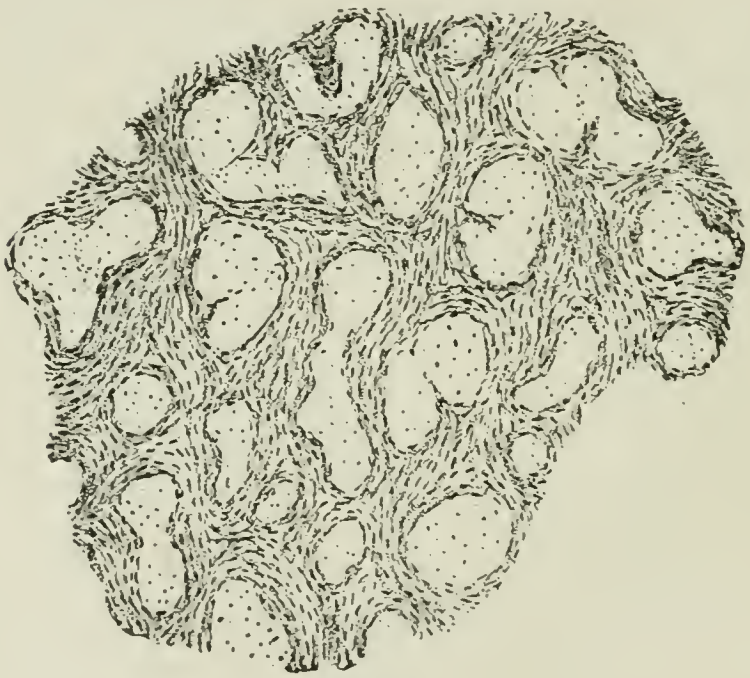


Fig. 10.

Appearances of interstitial neuritic in the optic foramen toward the end of the second month of filicic amaurosis. The interstitial connective tissue is very much hypertrophied and much nucleated. The clear spaces are those of the fasciculi. They are filled with neuroglia fibres, the nuclei being represented by the stippling in the spaces.

In the same region (optic foramen) softening of the neuroglia is less pronounced and may even be totally lacking. On the contrary, the hypertrophy of neuroglia and fibrillar gliosis is more marked. The result is that on transverse sections we see the connective tissue septa at a later date much hypertrophied, surrounding alveoli filled with neuroglia fibres and interspersed with nuclei.

The number of nuclei in the septa and in the alveoli may vary, but it is generally increased in the foramen.

Fig. 10 represents a part of such a section. The stippling in the alveoli represents the nuclei (neuroglia); the transverse sections of the fibres (neurogloia) not being visible under this magnifying power. Every one will agree that it is the picture of typical interstitial neuritis, and yet it is only a late result of parenchymatous neuritis. This appearance is only produced after destruction of the nerve fibres. At other points or in another nerve, the appearance of the transverse section is more like that of tabetic atrophy.

This special evolution of neuritis in the optic foramen may be a common enough condition. In a case of neuritis in man following panophthalmitis, therefore of the ascending type, many fibres in the optic foramen were reduced to $^1/_3$ of their size and much altered in their structure, while in the orbit, the disorganization was less advanced. Is not the marked degeneration in the optic foramen in some cases of alcoholic neuritis a condition of the same type?

Between the optic foramen and the chiasm, the process is briefly the same as in the orbit except that it is less rapid in its progress. We may see there a cavity of softening. The nerve fibres are destroyed still more rapidly and the interstitial edema is more pronounced than in the secondary degeneration which follows neurotomy. The neuroglia finally becomes hypertrophied, less than in the nerve, but perhaps more than in secondary degeneration. Is the change in the tract a simple secondary degeneration consecutive to destruction of the fibres in the orbit? Possibly this is the case.

The retina in filicic amblyopia. Filicic optic neuritis is, therefore, of the parenchymatous type. The first element which undergoes change in the nerve is the nerve fibre. The other changes (of the neuroglia, connective tissue and vessels) are certainly secondary and probably the result of the destruction of the nerve fibres. But is this neuritis really the primary condition in filicic amblyopia? Is it not perhaps secondary, consecutive to the retinal lesion? At the commencement of our investigation* showing that in filicic amblyopia the nerve cells

*J. P. Nuel, Alterations de la macula lutea, in Arch. d'ophtalm., 1896, t. 16, p. 495.

are altered very early and disappear at the end of 15 days, although according to some authors, they only disappear after one or two months (indeed, after one year or longer according to Hertel), we were inclined to see in these alterations in the cells the first changes of filicic amblyopia and to look upon the neuritis as a secondary phenomenon.

Our later investigations made in accordance with the Nissl method appear to confirm this opinion. In two dogs, blind less than 24 hours, one of which had received only two doses of the drug, there were evident signs of chromolysis in the nerve cells of the retina (partial dissolution of the granules of chromatin). There is a pericellular edema. Toward the 15th day, no part of the cell stains; not even the nucleus (which stains longer than the protoplasm). The cells are much altered, for the most part destroyed. Later still the cells of the neuroglia increase in numbers in this layer. In the meantime, the granules of the other layers remain on the whole normal (at least for 6 weeks longer).

We may suppose then, as in quinin amblyopia, that filicic neuritis is secondary to a lesion of the retinal nerve cells. However, some investigations of various kinds which we undertook later were scarcely favorable to this hypothesis. In the first place, chromolysis consecutive to simple neurotomy shows itself as early as the third day. In assuming, therefore, already a certain change in the nerve fibres one or two days before the onset of filicic amblyopia, chromolysis may be secondary to it just as in optic neurotomy. In all cases the difference in the length of time between the onset of chromolysis under both circumstances is too slight to warrant a conclusion so far reaching as that of the retinal origin of filicic amblyopia.

An absolute argument against the retinal origin of filicic amblyopia, at any rate against its exclusively retinal origin, is the lightning rapidity with which the nerve fibres are destroyed; a rapidity much greater than after neurotomy and than in quinin amblyopia, of retinal origin. Whatever the cause, it will be necessary to admit in filicic amblyopia that the toxic influence is exerted primarily on the nerve fibres: that is to say, it is a question primarily of parenchymatous neuritis. The poison may, however, also exert primarily a toxic influence on the nerve cell.

Birsch-Herschfeld has recently maintained the exclusively retinal origin of filicic neuritis, conformably to our first way of thinking. The impossibility of this is explained above. The author has also made the mistake of confining himself in his experiments to the rabbit—an animal in which it is very difficult to tell whether the sight is affected or not. However that may be, his experiments tend to show that one of the first lesions is that of the nerve cells of the retina; the result, also, of our experiments.

Let us remember first of all that filicic neuritis is of a parenchymatous nature. In some cases, chiefly in man, restoration of vision has been complete. The parenchymatous nature of the neuritis, which, indeed, affects all the nerve fibres, does not, therefore, preclude the possibility of complete recovery or, at any rate, of very appreciable amelioration in vision.

C. *Alcohol and Tobacco Amblyopia.*

Neither clinical data nor anatomical or pathological facts permit a radical distinction between the alcoholic and tobacco type of central scotoma.

A word, in the first place, on acute alcohol amblyopia. It comes on (in man) rapidly in both eyes, following one or more free indulgences in alcohol (ethylic or methylic). The blindness is often complete from the start. Sight may, nevertheless, be more or less restored. In a case we have under observation at the present time, the blindness was complete. A little eccentric vision has returned (fingers at 4 meters with one eye and at one foot with the other). The pupils are much dilated and motionless. The papilla was anemic at first—atrophic later.

From the absolute similiarity of this affection to filicic amblyopia, it is probable that both depend on the same anatomical lesion; a very severe parenchymatous neuritis. Experiments of this kind on animals have for the most part failed; Rhamowitch (1) nevertheless, has produced in the rabbit grave alterations in the retinal cells (by means of ethylic alcohol); Holden (2) has observed chromolysis in the retinal nerve cells as the first effects of the administration of methylic alcohol. Researches are still necessary in this direction.

We now come to the chronic form of alcohol-tobacco intoxication in man characterized by central scotoma.

If we put together the published cases and note the opinions expressed, the theory of interstitial neuritis seems the most probable. According to this supposition, the first change in central scotoma is an overgrowth of interstitial connective tissue. By proliferation and contraction, this tissue compresses the nerve fibres, causing their atrophy at the diseased spot, and secondary degeneration farther back. This seems to be almost proved so far as purely alcoholic amblyopia is concerned.*

Nevertheless, it appears also certain that a typical, double and also toxic, scotoma may result from a parenchymatous neuritis. That is to say, from a neuritis in which the element primarily affected is the nerve fibre, the interstitial tissue (connective tissue), etc., proliferating secondarily. Sach's case† a simple atrophy, otherwise called a parenchymatous neuritis, was due to alcohol and tobacco. Bunge's‡ simple atrophy, is probably of the same nature. Observations by *Wilbrand*§ and ourselves‖ at least prove that degeneration of the macular fibres alone cannot be due to interstitial neuritis, but to a simple degeneration, or rather to a chronic parenchymatous neuritis.

We have been led to reject the theory of interstitial neuritis for cases of alcohol-tobacco amblyopia. According to us, there is primarily a lesion of the nerve fibres on a greater or less scale, then immediately, but secondarily, an overgrowth of interstitial connective tissue and vascular changes in the portion of the nerve primarily affected. There is a parenchymatous neuritis, then later on, a secondary atrophy: that is to say, also a parenchymatous neuritis. In support of this view, we bring among others the following arguments: First, all the cases examined have been old, of several months or even a year or more duration. Now this is a longer time than

*Uhthoff, Arch. f. Ophthalm., 1886, fasc. 4, p. 93; 1887, fasc. 1, p. 257.

†Sachs, Arch. of Ophth., 1898, t. 28, p. 133.

‡Bunge, Ueber d. Gesichtsfeld, etc., Halle, 1884.

§Wibrand, Ophthalm. Loc. Heidelberg, 1892.

‖Nuel, Arch. d'Ophtalm., 1896, t. 16, p. 478.

is necessary for a primary alteration of the nerve fibres to become complicated with an overgrowth of the connective tissue and with vascular changes. After simple optic neurotomy, a period of two months is sufficient to produce this effect.

Second. The majority of these eyes have been removed from the cadaver. Those enucleated during life, including our own, have not been properly hardened, so that a study of the fine details has been impossible.

Third. It becomes more and more certain that optic neuritis of the most diverse types is of a parenchymatous nature. (See later.)

Fourth. It becomes more and more certain that the most diverse kinds of toxic neuritis, as well as toxic changes in the nerve centres, are without exception of a parenchymatous nature; that is to say their primary lesion affects the nerve elements, both fibres and cells.

The history of alcoholic neuritis is, indeed, very curious from our point of view. One of the cases of scotoma published by Uhthoff has certainly been complicated with it. The first cases of multiple neuritis published were put forward as of interstitial type. Later on, when Lanceraux had found a primary lesion of the nerve fibres, it was admitted that there were two kinds; the one interstitial; the other parenchymatous. Now since we have undertaken to re-investigate all the primary changes by the aid of the new methods, we no longer publish anything but parenchymatous types. It would seem, nevertheless, that alcoholism is a condition favoring hyperplasia of the connective tissue in the most diverse diseases in all parenchymous organs. From this point of view interstitial sclerosis of the optic nerve would be perfectly comprehensible in alcoholic amblyopia, but as a consequence only of parenchymatous neuritis. All the anatomical descriptions of toxic optic neuritis are in fact from very old cases of one or two years' duration. We are inclined to admit that the alcoholic forms of degeneration of themacular bundle are characterized by a predominence of connective tissue — a well established fact in the last phases of the disease, but a case published by Sourdille at the last International Medical Congress, Paris, controverts this idea. It is a recent case (several months) of the alcoholic type. We have had an opportunity of seeing the specimens and we agree with Sourdille that the case is not one of interstitial neuritis. Such are the ideas on this subject at the present time that tobacco amblyopia would occupy an unique position did we regard it as of

the interstitial neuritis type. Not only would it be the one well authenticated example of an interstitial optic neuritis, but it would be the only example of an interstitial toxic neuritis in general.

Retinal Origin of Alcohol-Tobacco Neuritis. The alteration of the bundle of macular fibres being primarily a parenchymatous process, having analogies with secondary degeneration, it is proper to inquire whether the atrophy of the nerve fibres is not secondary; if, like quinin amblyopia, it has not a retinal origin; the macular nerve cells being the first element changed.

Some time ago we were inclined to this way of thinking, in support of which the following facts, brought to light since then, may be cited: First, there is the retinal origin of quinin amblyopia. In the second place, acute intoxication by ethylic and methylic alcohol seems to affect first the nerve cells of the retina. Usher and Dean have seen a degeneration of the macular fascicula occur after a traumatic lesion of the macula in the monkey practically analogous to that of alcohol-tobacco amblyopia.

Nevertheless, investigations of different kinds undertaken by us in these last few years have brought no new proofs to the support of the retinal hypothesis. In the first place the partial atrophy and disappearance of the macular nerve cells observed by us and confirmed recently by Siegrist* prove nothing either in one direction or the other, especially since we have shown that the nerve cells of the retina are destroyed so soon after simple neurectomy.

On the other hand, our investigations have overthrown the hypothesis of a retinal origin, at any rate of an exclusively retinal origin of filicic neuritis. What always leads us to lean, in spite of everything, toward the retinal origin of alcohol-tobacco amblyopia, supported already by Shoen and Foerster, is the topography of the visual disturbance, the macular scotoma and the degeneration of the macular fibres only. None of the explanations put forward withstand the slightest criticism if we admit that the optic nerve is the primary seat of the process. Upon this hypothesis the degeneration of the macular bundle alone of the nerve fibres remains an engima whether the supposition of a parenchymatous or that of an interstitial neuritis be adopted. Moreover, many authors make no attempt even to explain this mystery. The most recent explanation, that of Sourdille, which assumes as a primary cause of the nerve changes a degeneration of the vessels of the macular bundle does not improve the situation. In a bundle as

*Siegrist. Arch. f. Augenheilk, t. XLI, p. 136.

uniform as the optic nerve one cannot conceive a vascular degeneration remaining limited to the macular bundle alone. This vascular degeneration is a reality, but it is a consequence of the degeneration of the nerve fibres. In this sense it may remain limited to the macular bundle alone. On the contrary the conditions become more comprehensible under the retinal hypothesis. It is only at their termination in the retina that the macular nerve elements are isolated to such a degree as to be capable of being injured alone, and especially in a form so uniformly typical, the other optic nerve elements remaining undamaged.

We may even remark that the nerve cells at the macula are crowded together in six or eight rows, against a single row and an incomplete one at that, in the remainder of the retina. This certainly implies more nutrive requirements for the macula, and consequently a greater vulnerability.

But this reasoning is not conclusive. It does not meet in fact a last and great objection which we shall not fail to make to the retinal origin of alcohol-tobacco amblyopia —an objection which consists in the fact that a number of forms of neuritis, according to all appearances retro-bulbar, have a great tendency to manifest themselves, at least primarily, under the clinical form of a central scotoma. This is, indeed, so frequent that the existence of a relative central scotoma is often sufficient to characterize as retro-bulbar neuritis any retro-bulbar process whatsoever. If it should be proved that a neuritis exclusively retro-bulbar without primary affection can really give rise to a central scotoma, the retinal origin of alcohol-tobacco amblyopia will be, if not absolutely controverted, at least rendered very improbable. In the absence of positive anatomical data, bearing on these different forms of so-called retro-bulbar neuritis, we venture the following hypothesis which has the advantage of applicability to all form of retro-bulbar neuritis. It follows from recent researches that a lesion of any part whatever of the neuron (cell or axon) re-acts on the other; the nutrition of which it impairs. The destruction of the cells is followed by degeneration of the axons (or nerve fibres) and inversely the section of the axon alters the vitality of the cell, provoking chromolysis and even involving its destruction. The injurious influence of a lesion of the visual axon on the cells from which it originates is, indeed, very pronounced, judging from the result of our optic neurotomies. On the other hand, it is admissible that the kind of favorable, conservative, trophic influence exercised by the nerve cells upon their axons presupposes the absolute integrity of the cell, and vice versa.

Let us now suppose a weak, but effective, injurious influence acting on the whole optic nerve: for example, in a part near the eye. The primary alteration of the nerve fibres cannot be destructive of the fibres, but it reacts appreciably on the retinal nerve cells and particularly on the macular cells which are more sensitive to noxious influence. It interferes then more or less with the trophic, conservative action exercised by the cells on these fibres; that is to say, on the macular bundle only. From that time these are less resistent to the injurious influence acting on the nerve and the macular fibres only may degenerate by a kind of retro-bulbar parenchymatous neuritis, but thanks to a retinal influence.

The origin of retro-bulbar neuritis is always double, in the nerve and in the retina, but the primary cause is in the nerve.

D. *Fundamental Proposition Applicable to all Forms of Optic Neuritis.*

Our anatomico-pathologic researches are not limited to toxic optic neuritis. They cover a number of forms of optic neuritis of various origins. They enable us to formulate the following propositions applicable to all optic neuritis, and which are distinctly at variance with generally accepted ideas. In every neuritic (optic) process, the element primarily affected, either profoundly changed or completely destroyed, is the nerve fibre. Secondarily, the interstitial tissue, neuroglia, connective tissue and vessels are affected. They begin to proliferate.

The destruction of the nerve fibres often seems to be the cause of the proliferation of the interstitial tissues.

The changes in the vessels and connective tissue seem to be always secondary processes. The same applies to the neuroglia, but in certain cases these alterations are more pronounced and seem to result from an initial irritation exerted upon them at the same time as upon the nerve fibres. The interstitial tissues are never altered without at the same time and, probably from the very first, the nerve fibres being profoundly changed.

In the last phases of neuritic processes, the interstitial tissues tend to take the place of the destroyed fibres. At the commencement and in some cases permanently the neuroglia predominates in these secondary processes. Sometimes the connective tissue is more in evidence. The circumstances which determine evolution in one or the other of those directions are not perfectly understood. When by reason of bad nutritive conditions, the neuroglia disappears the more resistent connective tissue tends to take the place vacated by it. Hypertrophy of the neuroglia

is so common that it may be said that without it there is no neuritis. It is, however, necessary to know that very often, however slightly acute the neuritic process may be, the initial hypertrophy of the neuroglia is followed by its partial or almost total disappearance. Still farther, in many cases of neuritis, the neuroglia dies and softens over a greater or less area, and to some extent upon the commencement of the affection without preliminary hypertrophy being evident. This occurs in very intense disturbances; notably, in infectious microbic forms. Every neuritic process is complicated sooner or later, but rather later than sooner, with a more or less pronounced hypertrophy of the interstitial connective tissue. An emigration of leucocytes is lacking in many cases of optic neuritis, or plays only a minor part. The hypernucleation of the nerve, sometimes very dense, is the result of the multiplication of the neuroglia cells. In no neuritis, do the leucocytes play a histogenic part. They disappear soon by absorption. Neither do they play, to any extent, the part of the macrophages, which, in the optic nerve, devolves on the cells of the neuroglia.

In a general way, the neuroglia in the fasciculi of the optic nerve plays the pathological role devolving in other organs (except the brain and spinal cord) on the interstitial connective tissue. At every alteration of the optic nerve the neuroglia responds by a proliferation of its cells and its fibres. The foregoing propositions deduced from studies of very diverse cases of optic neuritis are in brief analogous to those formulated by Weigert.* The contradiction between these propositions and the ideas generally in vogue is at once apparent. They imply, in fact, the definition of *parenchymatous optic neuritis*, when what we see underlying the descriptions of the majority of cases of optic neuritis, is the assumption of *interstitial neuritis*.

In our opinion, all cases of optic neuritis are parenchymatous in nature. We take the stand, in fact, that in every optic neuritis, at least at the commencement and at the time that the nerve fibres are already much changed, the connective tissue can scarcely compress the fasciculi—the neuro-neuroglia tissue—in the first place, because, contrary to the generally accepted idea, it does not surround such a bundle at any point on all sides (see above).

In the second place, because at the commencement of acute neuritis this compression is impossible on account of the interstitial edema which in distending preceptible spaces prevents the contact between the connective tissue

*Weigert, Centralbl. f. allgem. pathol. u. pathol. Anat., 1890, p. 729.

of the septa on the one side and the neuro-neuroglia tissue of the fasciculi on the other.

Here is a list of the forms of optic neuritis examined by us and which may be characterised as parenchymatous.

In the first place, we put filicic neuritis, the prototype of the acute parenchymatous form. It is, indeed, the only optic neuritis, which it has been possible to study in its most diverse phases. The facts thus brought to light have furnished us with a key to the understanding of certain appearances presented by other forms of optic neuritis. This form, unreservedly parenchymatous, is the infectious microbic neuritis which we have studied experimentally. The necrobiotic form of softening of the neuroglia absolutely predominates in it. The changes in the optic nerve following panophthalmitis seem to be often of a toxic, non-infectious nature. They have plainly the characters of parenchymatous neuritis with edema, softening of the neuroglia, etc.

Clinicians designate by the name of simple white atrophy that form coming on without the ophthalmoscopic signs of neuritis following all kinds of orbital processes (orbital abcess, tenonitis, erysipelas of the region of the eye, etc.) or following lesions at the level of the optic foramen. In a case of this kind—destruction of both optic nerves by a tumor of sphenoidal sinus—the nerve last affected presented the marked changes of filicic neuritis. The simple atrophy of clinicians following various intracranial processes is at least in some cases the result of true parenchymatous neuritis. Interstitial edema plays here a predominant pathogenic role.

The papillitis following cerebral tumors is plainly a parenchymatous neuritis just as in the supposed simple atrophies referred to a moment ago. Edema damages and at length destroys the nerve fibres. It is the same with simple white atrophy coming on without ophthalmoscopic signs of neuritis following invasion of the optic nerve by a tumor of the sphenoidal sinus.

Papillitis following cerebral tumors is plainly a parenchymatous neuritis.

The retro-bulbar neuritis of clinicians is of the same type. The preceding forms are types of more or less acute neuritis. As for the chronic forms, there is in the first place, tabetic atrophy which, it becomes more and more apparent, is a parenchymatous neuritis, ending in a true fibrillar gliosis. The secondary degeneration itself of the optic nerve is a chronic form of parenchymatous neuritis; the neuroglia, connective tissue and vessels becoming hypertrophied in it.

A THEORY OF BINOCULAR PERSPECTIVE, AND SOME REMARKS UPON TORSION OF THE EYES, THE THEORY OF THE VICARIOUS FOVEA, AND THE RELATION OF CONVERGENCE TO THE PERCEPTION OF RELIEF AND DISTANCE.

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To Wheatstone* belongs not only the credit of having demonstrated the importance of binocular vision in the perception of relief, but also the credit of having expressed views regarding the binocular perception of relief which are, so far as they go, the views generally held at the present time. While Wheatstone showed very clearly that the physical basis for the binocular perception of relief lay in the dissimilarity of the two retinal images of an object, he offered little explanation as to the means by which the brain was enabled to interpret this dissimilarity, and the later theories in general have been attempts to complete his theory by supplying this deficiency rather than attempts to replace it. Wheatstone realized that convergence played a non-essential part in the perception of relief. He did not perhaps possess such scientific proof of this as was furnished later on by Dove's† experiment with the electric flash and still later by Hering's‡ experiment with falling balls, but he was convinced that in stereoscopic diagrams it was necessary to fix the eyes upon but one point in a combined figure to obtain the idea of depth. In addition

*Phil. Trans., 1838. also Phil. Mag., 1852.

†Dove (Monatsber. d. Berl. Akad., 1841) showed that the flash of an electric spark gave sufficient time for the binocular perception of relief.

‡Hering, Arch. f. Anat. Physiol n. wissench. Med. Leipsig, 1865. S. 152.

to this he found that relief could be perceived binocularly in the after images of suitable diagrams.*

Another conclusion reached by Wheatstone was that since he could see no doubling of the lines in his stereoscopic diagram, in ordinary vision images situated upon non-corresponding points were fused and seen as one. From this conclusion and also from an experiment that I shall discuss later, showing that images falling upon so-called corresponding points may be seen double, he was led to believe that the law of corresponding points was erroneous or that it at least required modification.

Brücke, Brewster, and others denied Wheatstone's theory in its entirety, maintaining that our idea of binocular relief was gained by successively fixing our eyes upon different points of the object regarded. Brewster† did not believe that there was fusion of images lying upon non-corresponding points, but that the doubling of objects was unnoticed because one of the images was suppressed. It is possible that convergence, which Brewster claimed was the main factor in the binocular perception of relief, is an aid to the perception of depth, but the complete suppression of an image, in the sense that Brewster thought of it, would be detrimental to this perception.

Since it may at the present time be regarded as an established fact that movement of the eyes is not necessary for the binocular perception of relief, it follows, as was pointed out by Panum§ and later by Hering, that disparateness in the images of an object is alone sufficient to call up in the brain an idea of depth, and that the brain is able to distinguish between homonymous and heteronymous images. Hering‡ held that each retinal point had a definite depth "value" as well as a height and breadth value, and that stimulation of two retinal points having equivalent but dissimilar depth values i. e. corresponding points, called up a neutral sensation so far as depth was

*Rogers showed later (Am. Jour. of Science, New Haven. 1860, Vol. XXX, p. 387) that relief could be perceived in this way even when the after images were not produced simultaneously in the two eyes.

†Brewster, Phil. Mag., 1884, p. 363.

§Panum, Archiv. für Anat. and Physiol., 1861.

‡Hering, op. cit.

concerned. According to this assumption of Hering it seems to me that a slanting line when viewed monocularly should always give the same depth effect, but as a matter of fact the line sometimes appears to point towards and at other times away from the observer. Hence it is not possible to assume that each retinal point has a definite depth value in the brain in the same sense that it has a height and breadth value. The binocular perception of depth, therefore, must be dependent upon a more complicated relationship among the nervous elements concerned in vision than is entailed by Hering's hypothesis.

That fusion of images situated upon non-corresponding points can take place, as maintained by Wheatstone, is beyond a doubt, for it is an easy matter to construct dia-

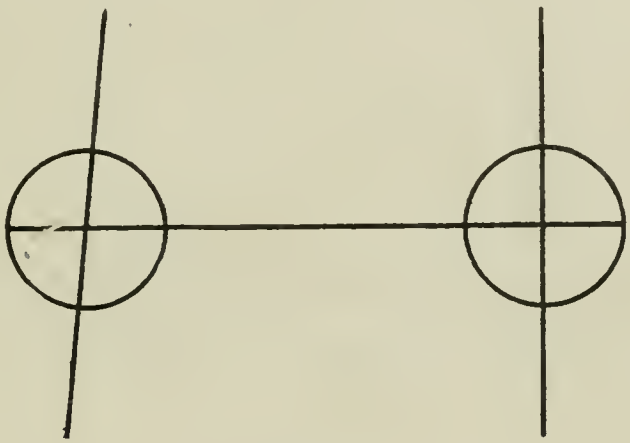


Fig. 1.

grams which differ so little that when viewed stereoscopically it is impossible to detect any doubling of the lines but which, nevertheless, beautifully produce the idea of relief. It is true that with practice it is possible to detect very slight doubling of images, but ordinarily we do not notice even the greatest amount of it, and it has seemed to me that the more successful I was in detecting this doubling the less readily I was able to perceive stereoscopic relief. The following facts show still more conclusively that the apparent fusion of two images situated upon non-corresponding points is the result of true fusion, and is not due to suppression of one of the images as stated by Brewster, and other observers. If a vertical line is combined with a slanting line (Fig. 1), the resulting

fused line always possesses a lateral slant in addition to a perspective effect, and strange to say, this still remains true even when the vertical line is much heavier than the slanting line. It is hardly conceivable that the vertical line should always be completely suppressed, especially when this line is markedly heavier than the other. Moreover, if both lines (A and B, Fig. 2) slant equally from the vertical, the resulting fused line will correspond neither to A nor to B but will appear perpendicular to the horizontal line, though not vertical on account of the per-

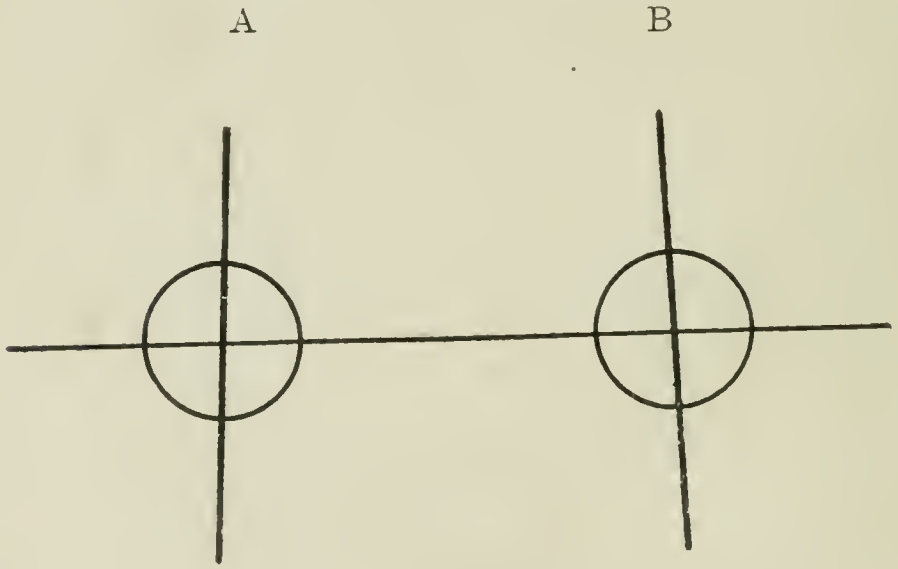


Fig. 2.

spective effect imparted to it. Here also it seems to make remarkably little difference whether one line is heavier than the other or not. Again, if two objects are placed, one a little in front of the other, and the eyes are fixed upon the nearer of the two, and then suddenly a screen is placed before the right eye, it will be noticed that the distant object apparently moves to the left. If the screen is placed before the left eye, the distant object appears to move toward the right. This shows that the image of the distant object is completely suppressed by

either eye, for otherwise in the case of one eye the object should not change its position. Since the movement is equal for both eyes, the apparent position of the distant object when seen binocularly must be half way between its position as seen by the right eye and its position as seen by the left eye. This experiment of course would prove little if the images were situated so far apart that the observer failed to fuse them and saw them double. It must be noted in this connection, however, that while the above facts prove that fusion of disparate images can take place, they do not necessarily prove that it is complete, and I shall try to show later that this fusion is in fact only a partial one.

To know to which eye each image belongs would be of little value to us and in fact might lead to confusion, but this knowledge would be necessary in order for us to consciously recognize whether the images are homonymous are heteronymous. It is not essential, however, that this recognition should reach our consciousness. All that is of service to us is that the disparateness of images should send to our minds an idea of nearness or of distance and this it does. As a matter of fact not only are we ordinarily unable to realize to which eye each image belongs, but, as just shown, we fuse the two images and see them as one.

Schoen,* in 1878, attempted to explain how it was that the brain could distinguish between homonymus and heteronymous images. He claimed that the essential explanation lay in the fact discovered by him, that an image falling upon the nasal half of the retina appeared to us brighter than a similar image falling upon the temporal half. He found that the images differed also in color, but he believed that this was of secondary importance.† Schoen's theory will be readily understood if reference is made to the diagram, Fig. 3. In this diagram F is the

*Schoen, Zur Lehre vom binocularen Sehen, Graefe's Archives für Ophtalmologie, 1878, B. 1, s. 24.

†He found also that an image on the nasal half of one retina appeared lower than the corresponding image on the temporal half of the other retina. This I have convinced myself is also true in my case. It seems to me it must be due to torsion of the eyes. I have an outward torsion of $1^1/_4°$.

fixation point and N an object within the horopteric circle. Through N the optic centres of the two lines are drawn eyes, O and O′ respectively, are intersecting the horopteric circle in the points A and B and the two retinae in the points *a* and *b′*. Through A and O′ a line is drawn intersecting the line BO at D. Here, then, is a condition in which the double images of both N and D must be referred to the same points, A and B, in space, the only difference being that in case of D they are homonymous while in the case of N they are heteronymous. According to Schoen, N appears nearer than F simply because

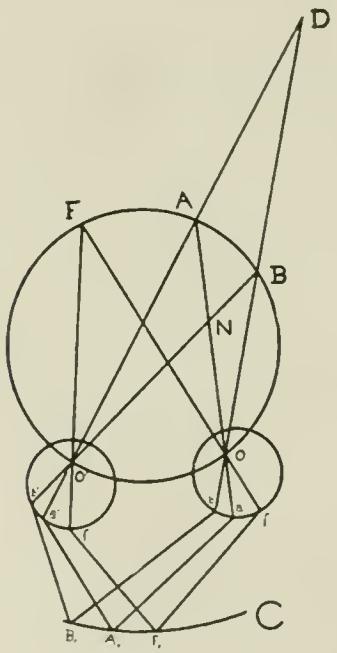


Fig. 3.

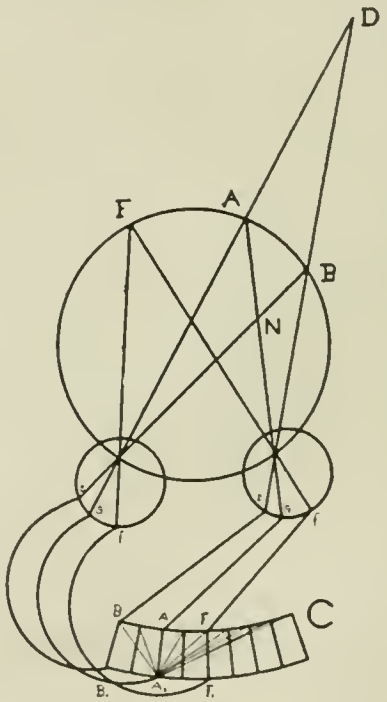


Fig. 4.

a, lying as it does on the nasal half of the right retina, appears brighter than *b′* which lies on the temporal half of the left retina. Schoen claims that if *b′* is in any way made to appear brighter than *a*, N will appear outside the horopter at D. It seems to me that if this theory is true, corresponding retinal elements must be connected with the same cells or cell systems in the cerebral cortex, or in other words, that Schoen's theory necessitates the acceptance of the theory of identity.

Assuming the theory of identity to be true, Schoen's theory could be elucidated as follows: Let C in the figure represent the cerebral cortex divided up into its units, Fc.

representing the foveæ, Ac representing a and a'; Bc, b and b'. Both N and D would therefore stimulate the same cortical points, Ac and Bc, but in the case of N, Ac would be the more intensely stimulated, while in the case of D, Bc would be the more intensely stimulated and this certainly could be regarded as sufficient difference to enable the brain to distinguish between N and D.

Unfortunately, however, it is not permissible to assume a common cortical representation for the two eyes. An insurmountable obstacle to this assumption, I think, is the fact that it is impossible to produce the idea of stereoscopic relief by throwing the proper images upon the retina



Fig. 5.

of *one eye only*. Another objection is the well known fact, first noted by Fechner, that an image appears brighter when viewed with one eye than when viewed with both eyes before one of which a dark glass has been placed. Furthermore, although it is generally stated that it is impossible to tell with which eye we are seeing, nevertheless the brain is able to distinguish between the two eyes. For instance, if one of the lenses in my glasses becomes smudged I always know, from a peculiar sensation in the corresponding eye, which lens is not clear. Helmholtz* noticed something of the same kind for he stated that if there should be a spot of dirt upon one of his stereoscopic diagrams he unconsciously rubbed the eye with which it

*Physiol. Optik., 1896, p. 894.

was seen. Then too, I have seen cases and heard of other cases of spontaneous intraocular hemorrhage, where the patient realized in which eye the vision had become defective and this without trying each eye separately. In addition to this, on the assumption of a single cortical representation for the two eyes it is difficult to explain the rivalry of dissimilar visual fields.

Aside from this aspect of the subject, I have carefully repeated Schoen's experiments and have failed to confirm the results obtained by him. Not only was his own method followed, but a new one was tried that perhaps was even better. In the latter method a modification of the well known Maddox rod was used, for the purpose in hand the instrument being constructed of sufficient length to allow of its being placed before both eyes at once. When such a rod is placed horizontally before the eyes, and two lights, one behind the other, are viewed through it, they appear as vertical streaks, and the only way aside from the accommodation, in which the relative positions of the lights can be determined is by means of binocular perspective. The information that possibly might be given by the accommodation can be practically excluded by having the lights at a sufficient distance or by means of suitably placed lenses. It is an easy matter to diminish the brightness of any of the retinal images of the lights by placing dark glass screens in suitable positions. Schoen's method need not to be described here. It is sufficient to say that I followed it as given in his article.*

The results that I reached from my experiments were the same by either method and were as follows: In stating them reference will be made to Fig. 3. I found that when the object was at N, and there was no artificial interference with its images, that no mistake as to its relative position was ever made. If *a* were darkened, N appeared farther off, but never outside the horopteric circle, although the more *a* was darkened the farther off N appeared. If, however, the illumination of *a* was entirely cut off the observer was usually doubtful as to the

*In these experiments convergence of the eyes was obviated by the use of a quickly moving shutter.

position of N, and sometimes said it was beyond the fixation point, but he practically always thought it farther off than under any other condition. Owing to the doubt in which the observer was, he was ready to grasp at any suggestion as to the apparent position of N. It is for this reason, I think, that N appeared more often beyond the fixation point to me than to any of the other observers, but even with me this occurred only when the illumination of *a* was entirely cut off or else reduced so low that *a* could not be recognized. I tested five persons besides myself with the uniformly negative results, just noted.

Theoretically, when the illumination of *a* is cut off entirely, N should appear at B. The fact that it does not cannot be explained by Schoen's theory, because in this case there is only a single image of N to be considered. In a way, the question is now one concerning monocular, not binocular vision, and the observer having but one feature, namely, the apparent brightness of the object, by which to arrive at a decision as to its position, concludes that it is distant. The fact that N is out of focus is not an objection to this explanation but quite the reverse, since an object outside the horopter would be also out of focus.

Schoen was unable to make an object at D appear at N, and I obtained the same negative results experimenting upon myself and two others, in this case as in the other. To prove that the apparent color of the images played no part in our perception of binocular relief, I made one image red and the other blue, and found that the idea of relief was about the same as before or as when the colors of the images were reversed.

It thus being necessary to reject Schoen's theory, it would seem that the only reasonable alternative remaining is that our ideas of binocular perspective are dependent upon the existence of some sort of relationship among the cortical units in the brain that correspond to the retinal elements. Whether this relationship is solely a spatial one or not, it may be represented diagramatically as such, just as force may be represented by the length and direction of lines. In Fig. 6 I have attempted to express schematically this relationship in such a manner as to explain, so I believe, the essential facts connected

with the binocular perception of relief. For the sake of comparison Fig. 4 has been drawn identical with Fig. 3, with the exception that the cerebral cortex is represented different. The latter is here represented as consisting of two equivalent systems, one corresponding to the right eye and one to the left eye. F′, A′, B′, are the cortical representatives of *f*, *a* and *b*, respectively, and similary, Fc, Ac. Bc, are the cortical representatives of *f*′ *a*′, and *b*′. Each unit in each system is supposed to be connected by series of nerve cells and nerve fibres with all or most of the units in the other system, the closeness of the relationship of any two units corresponding to their distance apart, and each unit also is supposed to be connected in-

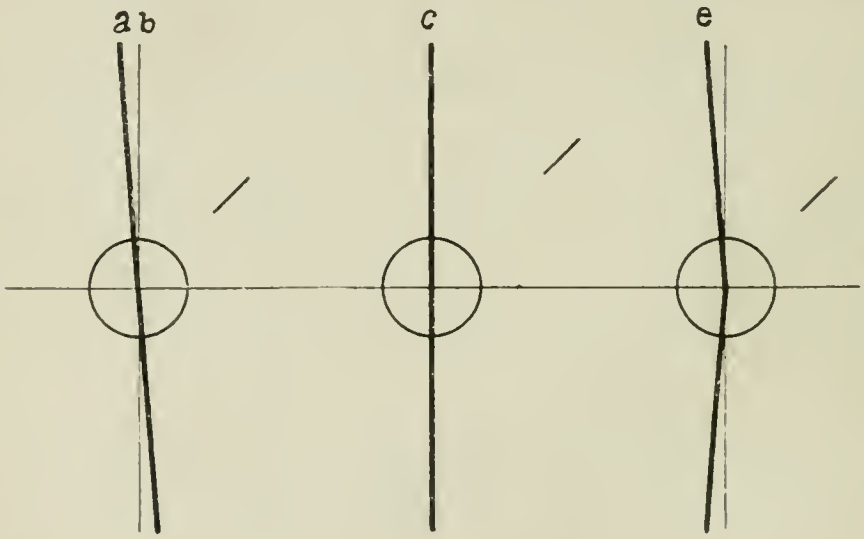


Fig. 6. Fig. 7. Fig. 8.

dependently with associated brain centres. For the sake of simplicity the connections of but one of the cortical units, Ac, have been indicated in the diagram. Corresponding points either retinal or cortical may be defined as those points or units which have the closest relationship, thus the distance Ac A′ is less than the distance Ac F′, Ac B′, etc., and Ac and A′ are therefore corresponding points. For convenience the circle of Müller is in the diagram supposed to represent a cross section of the true horopter whatever this may be.

The spatial relations in the cortical systems by means of which the position of an object is determined are best expressed algebraically. In the cortical system for the

right eye, then, distance to the right of F′ is considered positive and distance to the left negative in sign, while in the cortical system for the left eye distance to right of Fc is negative, to the left, positive in sign. When the algebraic sum of the distance of a unit in one system from its foveal unit and the distance of a unit in the other system from its foveal unit is equal to a positive quantity, the object causing stimulation of these two units appears to be within the horopter, when equal to a negative quantity without the horopter, and when equal to zero, on the horopter. The cortical mechanism by which we are enabled to estimate accurately the absolute distance of an object from the horopter must be a complicated one, and no attempt has been made here to represent it diagramatically. This aspect of the subject, however, presents some interesting problems with which I hope to deal at some future time.

Especial emphasis must be laid upon the fact that in this theory it is assumed that there is a separate cortical system for each eye, and that connecting the two systems and bringing them into relation with one another there is a third system, composed of a more or less complicated arrangement of neurones, upon which the binocular perception of relief is dependent. This intermediate system may thus be regarded as the cerebral representative of the hypothetical cyclopean eye of Hering and others, and may be spoken of as the cyclopean centre, and with it all ideas concerned with binocular relief would be associated. It is further assumed that the monocular systems may act independently both as regards each other and as regards the cyclopean centre. It is not assumed that the cyclopean centre is necessarily anatomically intermediate in position with relation to the monocular systems. Knowledge regarding the anatomical relations of those portions of the brain concerned in vision is still too slight for an attempt to be made definitely to locate the cyclopean centre.

As already stated, it is assumed that the nearer the two monocular images are to each other in the cortex, the stronger is the impression that they make upon the cyclopean centre, and it follows from this that when the two retinal images are only slightly disparate their cortical re-

lationship will be sufficiently strong to produce a plainly visible image in the cyclopean centre. It has been pointed out that when two retinal images are not too widely disparate only one image, and this intermediated in position with regard to the two monocular images, can ordinarily be seen. According to this theory the intermediate image corresponds to the cyclopean image and is produced by the nervous impulses passing from the two monocular systems acting jointly upon the cyclopean centre. The cyclopean image can therefore be regarded as the result of the partial fusion of the two monocular images. It is assumed that the two monocular images are still produced but that they are prevented from giving rise to separate ideas of position, the cyclopean image being sufficiently strong either to inhibit them directly or to inhibit other centres with which they are in relation. On the other hand, when the two retinal images of an object are greatly disparate their cortical relationship is less strong and the cyclopean image therefore less intense and less easily perceived, and hence, when the attempt is made to do so, it becomes possible to see the double images produced by the two monocular systems. Experiments show that even when an object is seen as two, an idea of relief is still produced, so that it is necessary to assume that the cyclopean image may give rise to an idea of relief without being consciously seen as a distinct image.

It will be seen that this theory is in accord with the views of Wheatstone without, however, conflicting with the law of corresponding points. It simply fills out and makes this law more complete. Superficially it bears a resemblance to the theory of Panum* in that the latter assumes that each point in each retina corresponds not to a single point but to a number of points in the other retina. According to it, fusion of images disparate in a vertical direction would be expected to occur, and this is in reality the case. The mechanism for lateral fusion, however, is much better developed than that for vertical fusion since in ordinary vision images are seldom separated vertically.

If, as assumed in this theory, every object not lying upon the horopter is represented in the brain by three images, namely, one binocular or cyclopean image and two

*Panum, op. cit.

monocular images, it would seem that it should be possible to obtain suitable conditions under which all three images could be seen at one time. When it is considered, however, that the majority of persons are unable to see the two images of an object, even when the latter lies at a considerable distance from the horopter, it is readily understood why there should be great difficulty in seeing all three images. To see the three images it would evidently be necessary that the two monocular images should be situated so close together that the binocular image would be sufficiently intense, and at the same time it would be necessary that the monocular images should be far enough apart for them to be seen as two. Hence practice in detecting double images under the least possible separation would be requisite. It is, nevertheless, with the utmost confidence in its accuracy that I make the statement that I have seen repeatedly all three images of an object at one time. I make this statement with some reluctance, however, for I feel that the temptation will be strong for those who are unable to obtain the phenomenon to maintain that what I have seen was the result of suggestion. The simplest and probably the best way to see the three images is to make use of some such diagram as that illustrated in Fig. 5, or Fig. 7. The eyes are fixed upon the centre of the figure which is held at a distance of about 60 cm. from the eyes and the card upon which it is drawn is then gradually inclined, the upper border approaching and the lower border receding from the eyes, until an angle is reached at which it is just possible to see at least two images of the line. Usually at this point it is possible for me to see all three images. If only two images are seen, however, a card is interposed between the eyes and the diagram so as to exclude the upper half of the figure only. On suddenly removing the card, the three images, if the experiment is successful, will be seen with really a startling distinctness and they may remain visible for some little time. It must be borne in mind that it is absolutely essential that the eyes be kept fixed upon the centre of the figure.

As a rule, if the eyes are not allowed to converge, the three images do not disappear immediately but remain for a variable length of time. Then one or both images may

disappear, but sometimes the binocular image disappears first, leaving both monocular images. In fact all possible combinations may at times be seen. Sometimes with the binocular image for quite a while it is possible to see but one monocular image, and strange to say, in my case it is the monocular image pertaining to the left eye that most often persists. That in this case one of the images is the binocular is shown by the fact that one of the images does not slant laterally and by the fact that the other monocular slanting image may be brought out by suddenly screening the left eye. Ordinarily the two monocular images of the line do not extend all the way to the centre of the figure but fade out before reaching it. This is as would be expected, since toward the centre of the figure the disparatness of the retinal images of the line is very slight and hence here the binocular image is much the strongest. The experiment can also be made by combining A and B (Fig. 2) by convergence or better by relative divergence of the eyes.

It has seemed to me that it is somewhat more difficult to obtain the phenomenon when the images are homonymous in the upper visual field and when they are heteronymous in the lower visual field. This is probably due to the fact that in ordinary vision double images are more often homonymous in the upper field and heteronymous in the lower and are hence more readily inhibited by the the binocular image under these conditions. It also seems always more difficult to obtain the phenomenon in the lower than in the upper field.

The reason the interposed card helps so much in this experiment, I think, is because the three images are seen so suddenly when it is removed that there is not time for any of them to be inhibited. The fact that the phenomenon is best seen when the card is used, together with the fact that it does not occur when the eyes are made to change their point of fixation, indicates that convergence plays no part in it. To do the experiment successfully it requires not only a great deal of care and close observation but probably also a certain amount of previous practice in making experiments in binocular vision. Hence it is not a thing that can be tried, with any hope of success, indiscriminately by anyone. I have found two other persons, however, who were able to see the three images.

When an object is situated a considerable distance from the horopter and its retinal images are consequently widely disparate, no more than two images can usually be recognized at one time. In ordinary vision, however, when the attention is not especially directed to the distant object, the latter, even when its retinal images are widely disparate, is not seen as two but as one. It has been impossible for me to decide whether the single image seen under these conditions corresponds in position to the cyclopean image or to one of monocular images, since the moment I attempt to fix my attention upon the distant object I perceive both monocular images. By closely watching the widely separated images of an object I have sometimes seen first one and then the other image temporarily disappear, much in the same way that conflicting images are known to behave. Sometimes only part of one of the images disappears; in rare instances both images disappear simultaneously. There is one condition at least under which one image regularly disappears and that is when a near object obstructs for one of the eyes only the view of a distant object upon which the attention is directed. In this case the obstructing image, or at least the obstructing part of it, disappears, and the nearer object may appear displaced from its true position. Whether such phenomena as these ordinarily play any part in the perception of relief it is difficult to say, but it is certain that they could do so only in case of widely disparate images, where the perception of relief is least delicate, for the experiments already mentioned show that in the case of slightly disparate images it is the cyclopean image alone that is seen. For instance, if A and B (Fig. 2) are combined, the resulting image seen evidently is the monocular image of neither A nor B since it differs in position from either, and if one eye is suddenly screened the image will be seen apparently to change its position to that of A or B according to the eye that is screened.

It follows from the fact that three images of an object can be seen simultaneously that while the cyclopean image is the result of the fusion of the two monocular images, this fusion is incomplete, for otherwise the two monocular images could not be seen. That the fusion of the two monocular images is incomplete is also borne out by the fact that the

binocular perception of relief is still possible even when both images are seen, as shown by Hering's experiment with falling balls, and by the fact, to be mentioned again later, that relief may be produced binocularly by two images which differ in color.

In the light of this theory I shall now discuss an important experiment of Wheatstone to which reference has already been made. If Fig. 6 is combined with Fig. 7, it will be noticed that the heavy line *c*, instead of fusing with *b*, seems to fuse with the heavy line *a*. In other words, there apparently is fusion of images lying upon non-corresponding points, while two images lying upon corresponding points are not fused and apparently are not even seen in the same place. If it is in reality a fact that two images lying upon so-called corresponding points can be referred to different points in space, the theory of identity, that is, the theory that each pair of corresponding retinal points is represented in the brain by a single nerve cell, obviously must be erroneous. It might at first be thought that the above phenomenon is only apparent and due to a suppression of *c*, but it seems incredible that *c* should always be suppressed in preference to the thin line *b*. Then, too, there is a definite perspective effect produced in *a* so that it no longer appears to lie in the plane of the diagram. It is true, as Hering maintained, that when *a* is viewed with one eye only, there is still a perspective effect produced, but this is by no means so marked and often it is not the same in direction as when the two diagrams are united by convergence or by means of the stereoscope. That *c* and *a* have fused may be shown also by suddenly placing a screen before the left eye, this causing *a* apparently to rotate to the left. Anyone who makes the experiment must feel sure that *c* fuses with *a*. Very seldom *c* or a part of *c* momentarily may be seen, not fused with but in the same place as *b* and this may occur while *c* and *a* are still fused. In fact at times there may be a rivalry between *c* and *b*, now one and now the other appearing in the position of *b*.

Schoen* thought that the phenomenon was due to torsion of the eyes and went even so far as to state that when he made the experiment he felt a sensation as if a motion of

*Op. cit., N. 62.

the eyes took place. To prove that torsion occurred, he placed a line as an indicator beside each figure so that when the figures were combined the lines should be continuous unless the eyes underwent torsion. This method fails with me, for I can often manage my eyes so that the indicator lines are continuous and still obtain the phenomenon. If great care is not exercised, however, slight lateral or vertical movements of the eyes may throw the two indicator lines out of apposition. In my case they are just as likely to be thrown out in one direction as the other and this would not be the case if torsion was responble for it. It is possible also that the torsion accompanying downward convergence of the eyes or perhaps an inherent torsion of the eyes may have led Schoen astray. At any rate the following modification of the experiment proves conclusively that his explanation is erroneous. If Fig. 7 is combined with Fig. 8, *c* fuses with the broken line *e*, and this in no way could be explained by torsion of the eyes, thus showing that torsion not only plays no part in this experiment but is not concerned in binocular vision in general.'

It would seem therefore that the theory of identity as ordinarily understood is indeed erroneous and that this experiment of Wheatstone is in entire accord with the theory of binocular perspective outlined above. For according to the latter theory it must follow that what seems to take place in this experiment is exactly what does take place, that owing to the simularity in width of *c* and *a*, the nervous connections between their cortical representatives are so much more numerous than those between the cortical representatives of *c* and *b*, that *c* fuses with *a* instead of with *b*. In other words, the cyclopean image produced by *c* and *a* is stronger than the cyclopean image produced by *c* and *b*. As in binocular vision in general, the monocular images of both *c* and *a* are usually inhibited, but as also occurs in ordinary binocular vision, occasionally they may be plainly seen and especially is this so when the diagram has been studied for a long time and when an effort is made to see them. This accounts for the fact that *c* is sometimes seen at *b*, and it is no doubt this occasional appearance of *c* at *b* that led Hering to state that the phenomenon of Wheatstone did not occur when the retinal image of *c*

was accurately superimposed upon that of *b*. In my own case, even when the greatest precautions are taken to ensure that the retinal image of *c* shall coincide with the retinal image of *b*, it is only exceptionally that it does not appear to fuse with *a*. For instance, if the lines e and k (Fig. 9) are fused with the lines e' and k' respectively and care is taken that the lines f and f' appear in apposition, and further, if allowance is made for torsion of the eyes by tilting the plane of the diagram until the lines f and f' appear as one straight line, *c* and *a* still appear to fuse and *b* still appears as a single line.

In connection with the subject of torsion of the eyes, it is interesting to note that the fact that lines situated upon non-corresponding points can be fused is of consider-

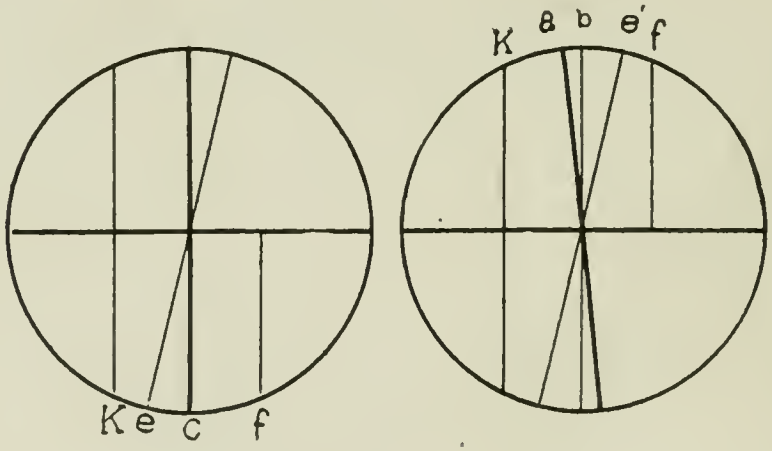


Fig. 9.

able practical importance, for failure to recognize this fact has led certain ophthalmologists into error. Noticing that lines displaced at an angle to each other were readily fused binocularly, they concluded that the fusion was due to torsion of the eyes and that therefore the eyes had the power to undergo a corrective rotation on their optic axes.* From this it was easy to believe that there was such a thing as cyclophoria, in the same way that there was eso-

*Helmholtz, (Op. cit., p. 634-635) gave some experiments which he thought went to show that the eyes possessed the power to undergo this corrective rotation, but to me it seems difficult if not impossible to account for the phenomena described by him on the assumption of a torsional rotation. On the other hand, they can readily be explained on the grounds of fusion, a fact strangely enough, Helmholtz entirely overlooked.

phoria, exophoria, etc., and attempts have even been made to relieve this purely hypothetical condition. I have elsewhere taken occasion to point out this error.*

The fact that in monocular vision the apparent position of a line is often modified by other lines lying near it, suggests the idea that it is something of the same kind that occurs in stereoscopic vision. This, however, is not the case. If the centre of Fig. 10 is viewed steadily with one eye for a short time and then the eye is quickly fixed up-

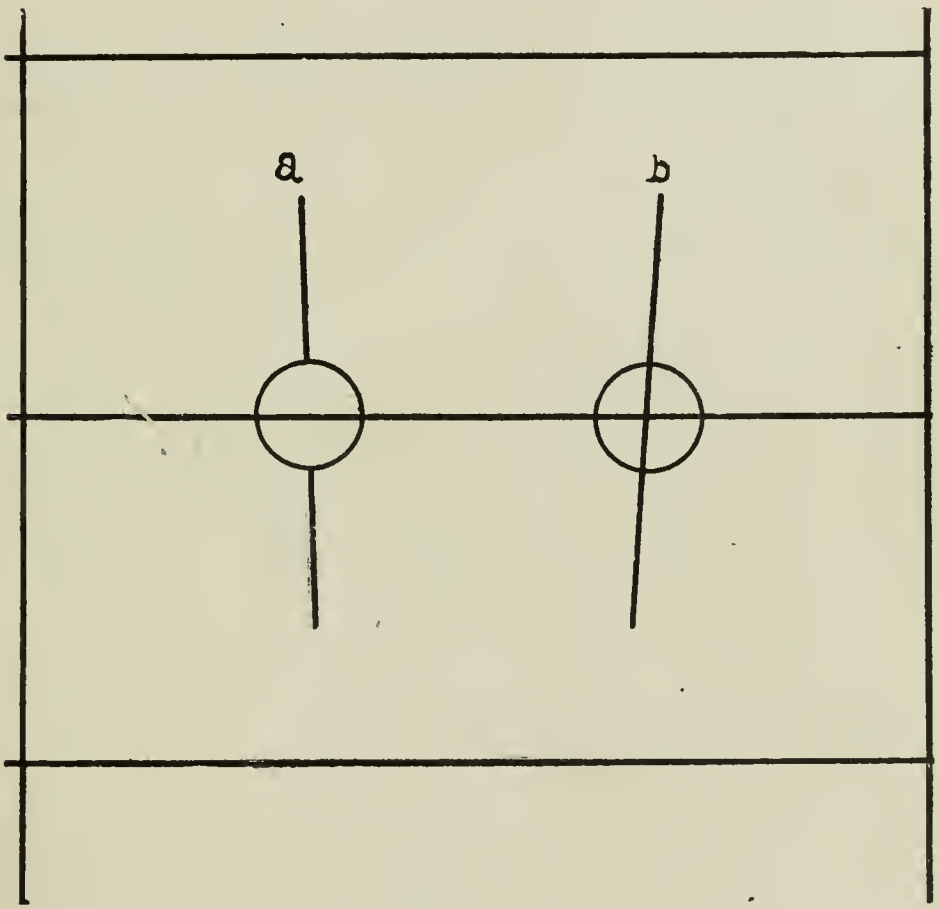


Fig. 10.

on the centre of Fig. 9, the vertical line *c* will appear bent, but in a direction opposite to that of *e*. This is probably due to the unconscious mental comparison of *c* with the after image of *e*. It will be noticed that this is exactly opposite to what takes place in stereoscopic vision, for when Fig. 9 and Fig. 10 are united by convergence, the resulting fused line bends in the same direction as *e*. On the other hand the following experiment seems to show

*Jour. Amer. Ophth. Soc., 1899.

that the centres for monocular vision are not able to take advantage of the information furnished by the cyclopean centre. If *a* and *b* (Fig. 10) are united by convergence it will be noticed that all of the resulting single line appears perpendicular to the horizontal line except that portion which passes through the small circle, this, the monocular portion as it were, retaining a slanting position. Incidentally this experiment also offers conclusive proof that the fusion of *a* and *b* is not due to torsion.

As is well known, even if the lines in stereoscopic diagrams differ in color, or if one set of lines is white and the other black, a definite perspective effect may still be produced. The question arises, then, as to the nature of the cyclopean image under such conditions. If in Fig. 1 one line is made blue and the other red, on combining them I usually see a blue line only, but this evidently does not correspond to the original blue line since it has not the same position and is not quite so blue as the latter. Sometimes bits of red may be seen along the combined line, while at still other times it seems to have almost a purple tint. If after the figures are combined, a screen is placed for a moment before the eye which is viewing the red line, on quickly removing the screen the combined line for a short time appears red. Thus the combined line while differing entirely in position from either of the separate lines, may more or less completely take on the color of either of the latter. Similar phenomena occur in the case of black and white lines drawn upon a grey field. It would seem, therefore, that in the cyclopean centre there is no distinction made between nerve calls indirectly stimulated, for instance, by red light and nerve cells indirectly stimulated by blue light, or, in other words, that the cyclopean centre is not concerned in the perception of color or lustre but of position alone. This is also borne out by the fact that it is difficult if not impossible, to mix colors binocularly. The color of the binocular image is probably supplied in an indirect manner by one or both of the monocular systems.

In the case of many persons the image in one eye is more readily suppressed than in the other. For instance it is impossible for some persons to look through a microscope with the left eye without closing the right eye, al-

though it may be perfectly easy for them to use the right eye for this purpose and keep the left eye open. Again, it has been observed that in many instances if a person is asked to interpose a small object, such as a pencil, in the line of sight of a distant object, keeping both eyes open, he will always place the pencil before the same eye, the so called directing eye. This experiment is not successful in my own case because I always see the pencil double and can place it before either eye at will. Such facts as these, as well as others dependent upon the same principles, seem to me to be examples of monocular vision gaining the supremacy over binocular vision with a preference of one eye over the other, just as the right hand is usually preferred to the left hand. They can not justly be regarded as indicating that suppression takes place in this way in the binocular perception of relief, because the conditions under which they occur are not such as to call for a perception of relief.

Such facts, however, have been regarded by some observers, notably by Javal, as indicating that a person who possesses a directing eye always estimates the position of an object from the standpoint of the directing eye. To prove that this is not necessarily the case, I selected a person who gave evidence by these tests of having a well marked directing eye, and made the following simple experiment upon him. I directed him to sit before a table and then to place a pencil before him so that it would point straight forward. While he was fixing his eyes upon one end of the pencil, I suddenly placed a screen before his non-directing eye and asked him if the pencil changed its position. He immediately answered that it did, thus showing that the non-directing eye must have had an influence upon the apparent position of the pencil. If the directing eye was screened in a similar manner the pencil appeared to him to change its position in an opposite direction.

It is perfectly conceivable, however, that cases may exist in which the nervous mechanism for the binocular perception of relief has been insufficiently developed, and in which therefore objects are always seen from the standpoint of one eye. On the basis of such an assumption it is possible to build up a theory that seems to explain many cases of squint. If it is assumed that while the cortical

system for each eye may otherwise be connected with its associated brain centres in a normal manner, the system of neurones connecting these two monocular systems, that is, the cyclopean centre, has not reached the proper stage for carrying on its functions, it follows that when an attempt is made to use the two eyes together there will be diplopia of all objects, or at least of all those not situated upon the horopter. In order to avoid this diplopia the image in one eye must be suppressed, the suppression taking place in the more nearly perfect eye. In case the eyes are practically equal, no permanent choice may be made between them, sometimes one and sometimes the other being used. Squint will then finally result, for since one image is always suppressed there will be nothing to direct the eye in which suppression occurs to take its proper relative position, thus allowing relative insufficiences of the ocular muscles, dependent no doubt in many cases upon errors of refraction, first to become manifest and then gradually to increase. Squint having once been established, the suppression of the image in the squinting eye would occur still more readily and the development of the cyclopean centre would be retarded. This would explain the difficulty usually experienced in obtaining true binocular vision after operation in cases of long standing squint, although the vision in the squinting eye may be little impaired. Following this theory, the amblyopia that usually occurs in squinting eyes is to be regarded as due either to a lack of further development of the eye, or to an actual deterioration of the latter, but in any case to non-use. The degree of the amblyopia would depend upon the length of time that had elapsed before a permanent selection of one of the eyes had been made. It has been for a long time a debated question as to whether squint is due to amblyopia or whether amblyopia is due to squint, it being always assumed, however, that they bear the relation of cause to effect. According to the theory just advanced, the amblyopia and the squint do not bear to each other the relation of cause to effect, but each is independently the result of a lack of development of the centre for the binocular perception of relief. This theory would explain why monocular amblyopia is not always associated with

squint, why squint is not always associated with amblyopia, and why alternating squint sometimes occurs. It would be going too far, however, to say that all cases of squint are to be explained in this way, for the possibility of congenital amblyopia or an inequality in the ocular muscles being alone sufficient to cause squint, cannot be denied.

That the mechanism for the binocular perception of relief is really absent, or at least imperfectly developed, in a number of strabismus cases, I believe a large number, is made evident by the fact that certain cases do not project their images according to the anatomical foveæ, that is, incorrectly, as is the case for instance in paralytic squint, but when they are made to see double they project their images absolutely correctly. And what is especially interesting, after an operation has been performed that corrects the manifest squint, the patient complains of marked diplopia which can only be overcome by placing prisms of such strength before the eyes as to counterbalance the effect of the operation. These cases have been explained by assuming that a new fovea, a so-called vicarious fovea, has been developed in the squinting eye, which, at least for binocular vision, performs the function of a true fovea. Recently I have studied a case of this kind* and as result I have no hesitation in stating that this view is erroneous. The case was an especially favorable one on account of the intelligence of the patient and the high visual acuity in each eye. By careful tests I found that there was no perception of stereoscopic relief and that although the projection in each eye continued correct, the so-called vicarious fovea changed its position according to the distance the test object was removed from the eyes. The apparent fusion of images that occurred was due in reality to suppression of one of the latter. On the other hand, such a case as this, fits in perfectly with the theory of squint just advanced. According to this theory there is not a new system of corresponding points established, but, on the contrary, even the old system is out of function. Each eye then learns to localize independently of the other so that instead of

*The Theory of the Vicarious Fovea Erroneous. The Ophthalmic Record, June, 1901, p. 300.

binocular there is double monocular localization. In the case just mentioned the squint was of the alternating variety so that there was an especially good opportunity for each eye to learn to localize correctly.*

A few observers† have stated that in cases of this kind that have been operated upon there may occur at a certain stage the phenomenon of binocular triplopia. They explain this on the basis of the theory of the vicarious fovea assuming that a period is reached after operation during which the patient localizes with reference to both the true and the vicarious fovea at one time. The phenomenon can be explained equally well by assuming that before the two monocular centres have learned to localize according to the new positions of the eyes, the binocular centre begins to take up its work. As a result each of the three centres localizes its image in a different place, thus giving rise to the idea of three separate images. It will be seen that this corresponds to the binocular triplopia observed by me under normal conditions.

Thus far consideration has been given mainly to the manner in which disparateness in images calls to the mind a perception of relief. It is evident, however, that although disparateness in images is alone sufficient to produce the idea of relief, convergence of the eyes could also offer important evidence as to the positions of objects, and it would be strange indeed if the brain were not able to avail itself of such a valuable source of information. It is a difficult matter to decide how great a part convergence ordinarily plays in the perception of relief, but that it plays some part in this I think there can be no doubt. It is probable that its chief value is in the case of greatly disparate images and that it plays little if any part when the images are only slightly disparate. The following experiments were made to determine, if possible, whether or not it is the sensation arising directly from the movements of the

*In this case the double monocular localization was remarkably accurate. I have seen a number of cases, however, in which the localization was so inaccurate that the patient could not determine which image was to the right of the other, although two images, far apart, were plainly seen.

†Tscherning, Physiologic Optics. (Trans. by Weiland), 1900. p. 335. Also see Landolt, Norris and Oliver's System of Diseases of the Eye, 1900, Vol. IV. p. 86.

eyes during convergence, or in other words, whether or not it is muscle sense, that helps us in our perception of relief.

By means of an instrument,* devised for other purposes, that consists of an arrangement of four mirrors, two for each eye, it is possible to produce the optical effect of convergence, so far as the two retinæ are concerned, by rotation of the mirrors. Movement of the eyes is easily prevented by fixing them upon an object seen immediately below the mirrors and whose apparent position is hence not influenced by the instrument. In making the experiments I usually selected as objects a chinmey on the roof of a distant building and a vertical rod placed within a short distance of the instrument. The upper part of the rod was seen reflected "through" the mirrors while the lower part could be seen below them. The instrument was at first adjusted so that all of the mirrors were parallel, and the eyes were then fixed upon the portion of the rod visible below the mirrors. Under these conditions the images of that portion of the rod reflected through the mirrors would fall upon corresponding points while the images of the distant chimney, also seen reflected through the mirrors, obviously would fall upon non-corresponding points and in fact could be seen as two homonymous images. The mirrors were then rotated until the two images of the chimney exactly coincided while the reflected images of the rod were seen heteronymously doubled. By means of suitably placed checks the rotation of the mirrors was limited so that at one limit of their motion the images of the rod, and at the other limit the images of the chimney, fell upon corresponding points. It is easy to see how the eyes could now be artificially fixed, as it were, by simply moving the mirrors, either rapidly or slowly, first upon one and then upon the other object without changing the position of the eyes in the least. It did not prove a difficult matter to keep my eyes fixed upon the portion of the rod seen below the mirrors. In fact, after a little practice I was able to keep my eyes steady without fixing them upon this portion of the rod and could therefore make the ex-

*F. H. Verhoeff. The Johns Hopkins Hospital Bulletin, May. 1899. Also, Transactions of the American Ophthalmological Society, July, 1899.

periment with the test objects in the direct line of sight.

In this way I have succeeded in convincing myself that muscle sense is of little value so far as the perception of relief is concerned, the latter apparently being just as definite when active convergence is replaced by means of the instrument as when the eyes are allowed free movement. The additional ideas of relief generated during active convergence are therefore, in all probability, not due to muscle sense, as is generally assumed, but are due either to the motion of the images upon the retinæ or to the confirmatory evidence given by the change from homonymous to heteronymous doubling or vice versa. In either case they must be dependent upon the same cortical mechanism that comes into play in the perception of relief by double images, that is, upon the cyclopean centre alone.

It seems more than probable also that the muscular sensation associated with *passive* convergence does not directiy give rise to an idea of distance. Experiments* made to determine the accuracy with which the distance of an object can be estimated by passive convergence alone, have indicated that the information furnished by the latter is very inexact. The following fact seems to bear this out, or at least to show that little reliance is placed upon passive convergence so far as the direct estimation of distance is concerned. If two equal prisms, each of about three degrees, are placed with their bases out, one before each eye, and an object is viewed through them, instead of appearing nearer to the observer, as would be expected from the increased amount of convergence necessitated, the object will almost invariably appear farther off, or at least no nearer. In the Ophthalmic Record for December, 1900, Duane states that he has recently tried this experiment upon twenty-eight persons, many of them under the influence of a mydriatic, and in "but a single instance (and that a very uncertain one) was the distant object alleged to be nearer." In twenty-three cases the distant object appeared either smaller or more remote; and in seventeen of these twenty-five cases it was both smaller and more remote; in two cases it appeared smaller but not more remote; in four cases

*See Helmholtz Physiol. Optik., 1896, S. 796.

more remote but not smaller. It is noteworthy that a distant object appeared both smaller and more remote in the case of a presbyopic patient aged 65. Duane generally used prisms of higher degrees than those mentioned above. I have noticed that if the prisms are very quickly dropped in place before the eyes the first effect may be to make the object appear nearer, but this is only momentary and is no doubt due to the fact that the object is seen in double images until convergence has taken place.*

The explanation that first suggests itself is that the above phenomenon is dependent upon the disturbance of the normal relation between accommodation and convergence. In the experiment the eyes must be accommodated for the original distance while they are converged for a much less distance, and it would seem probable that it is the effort to overcome the stimulus sent to the ciliary muscles by the additional convergence that gives rise to the idea that the object is more distant. The fact, however, that the phenomenon still occurs when the accommodation is paralysed by atropin, that it occurs when the effort to relax the accommodation is obviated by the use of concave glasses, and moreover, that it occurs in cases of presbyopia, strongly suggests that the dissociation of accommodation and convergence is not the most important factor in its production. In addition to this, I have found that in my own case the phenomenon still occurs when no effort is made to bring the object into focus and it is permitted to become blurred.

It seems to me that the phenomenon is dependent upon the disproportion existing between the size of the retinal images of the object and the amount of convergence. If this is true, and it seems to be the only other possible explanation, it indicates that the muscular sensation associated with passive convergence is not directly related with the idea of distance but with the idea of size. It is obvious that the size of the retinal images of an object and the amount of convergence required to fix the eyes upon this object, accurately determine the absolute size of the latter. That is to say, with a given amount of conver-

*Possibly this accounts for the conflicting statements regarding the apparent position of objects seen through converging prisms.

gence and retinal images of a given size the object can be of but one size, and these two factors having called up in the brain an idea of size, an estimate of distance can then be made. This method of estimating distance binocularly would fit in with the method adopted in monocular vision, since in the latter the estimation of distance is for the most part dependent upon the judgment of size. When it is considered that in the progress of evolution monocular vision was undoubtedly well developed before stereoscopic vision could have begun, it is natural to assume that the information furnished by convergence, when the latter, finally came into existence, should have been associated with brain processes already well established rather than with processes newly called into existence. At any rate the assumption that passive convergence is primarily associated with the idea of size, and only indirectly with the idea of distance, explains the phenomenon under discussion in a most perfect manner, for it is evident that when the prisms are placed before the eyes, the size of the retinal images compared to the amount of convergence would primarily indicate that the actual size of the object was diminished and secondarily that the object was farther away. It will be seen that this would explain why in some cases the object simply appears smaller, in other cases both smaller and farther away, and in still other cases, farther away only.*

An interesting modification of the above experiment indicates that the disproportion between the amount of convergence and the size of the retinal images is not sufficient to overcome the perception of relief called up by disparate images. If a small round spot is observed through the instrument just mentioned, and then the mirrors are slowly rotated so as to necessitate a movement of convergence on the part of the eyes in order to keep the images of the object combined, the object appears to

*In this connection should it be noted that even the idea of distance produced by accommodation must give way before that called up by the size of the retinal images of an object. This is shown by the fact that concave glasses, although necessitating strong accommodation to overcome them, nevertheless, by reducing the size of the retinal image of the object, cause the latter to appear more remote. This holds true also in monocular vision.

approach the observer, but when the motion of the mirrors ceases appears just as far or even farther off than before. The apparent approach of the object during the rotation of the mirrors is in accord with the resulting active convergence of the eyes, but since, as already shown, there is reason to believe that even active convergence, or rather the muscle sensation incident to the latter, is not of much value in the perception of relief, it seems likely that the apparent advance of the object is due, not to muscle sense, but to a disparateness of the retinal images arising from the fact that the images must separate faster than convergence can follow.* It is evident that here there must exist practically the same contrary evidence as in the experiment with the prisms, but in this case the additional evidence offered by the presence of heteronymous images is the stronger. When the mirrors cease to rotate, the conditions are the same as in the experiment with the prisms, and the object consequently appears more remote. Helmholtz† thought that the apparent recession of an object that occurred when a prism was placed base out before one eye, was due to the distortion that the prism produced in one of the images of the object. That such is not the case is shown by the fact that the same phenomenon, as just noted, occurs when mirrors are used instead of prisms, and that it occurs when diagrams‡ are united by convergence without the aid of an instrument.

*This strongly suggests that the attempts, such for instance as those made by Wundt, to measure the exactness with which changes in distance can be recognized by convergence alone, have always in reality resulted in the approximate determination of the least perceptible disparateness of two retinal images.

†Physiol. Optik., 1896, p. 806.

‡Two similar coins may conveniently be substituted for diagrams.

ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC LITERATURE.

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(Quarter ending March 31, 1902.)

Further Clinical Experiences with Haab's Giant Magnet, with Some Experimental Statements Regarding Hirschberg's New Large Hand-Magnet.

BARKAN, A., San Francisco. (*Archives of Ophthalmology*, Jan., 1902.) The writer refers to his report of eleven cases of extraction of particles of steel and iron from the interior of the eye published in previous numbers of the *Archives*, and adds the histories of ten new cases, with comments.

In the first group (eleven cases), eight recovered and three were lost; in the last group (ten cases), eight recovered and two were lost; thus of the twenty-one cases, sixteen, or about seventy-five per cent., recovered.

In his last group of cases, Barkan tried the Asmus siderescope, as improved by Hirschberg, but without much success. In this connection he says: "If the use of the original Asmus sideroscope, according to Knapp, requires the patience of an angel, Hirschberg's modification of it, while it quite fulfils what its inventor claims for it in a scientific laboratory or examination room away from the noise of the street traffic and the effects of electric wires, becomes a useless instrument in one's office or in an operating room not especially adapted for it.

"In the last cases published, when the presence of a for-

eign body within the eye could not be of a certainty proven by the ordinary clinical methods of examination, I have relied upon the giant magnet to act as a sideroscope, to find the foreign body and then extract it, and the magnate has not failed me in either task a single time thus far. I have been able to get a long satisfactorily without X-rays, so cleverly used by Drs. Kibbe, Sweet, and others in this country, and especially by Dr. Mackenzie Davidson of Moorfields in London, who produces stereoscopic effects by a very interesting and useful method demonstrated by him at the last International Congress in Utrecht.

"My experience has taught me that the foreign body is best removed through the enlarged initial opening, and that the giant magnet can be relied upon to do its work from start to finish without assistance of any hand magnet, always under condition that the strongest magnet available (up to this time Haab's) be used. In Knapp's last publication, the use of the hand magnet had proven unsuccessful in quite a number of cases. I find it of much use to thoroughly study the way in which the accident was produced, to have the patient damonstrate to me the position of his body with relation to the source of trouble, so as to get at the direction in which the chip of steel has travelled to and into the eye. In thus finding the position in which the magnetic force lines could be employed to best advantage, it has happened to me repeatedly that in cases where extraction was unsuccessful at first, after the patient's head and eye were put in the same position as they were in when the accident happened, the extraction of the foreign body was promptly accomplished. I have never had any difficulty in getting the patient to assume whatever position of head I wished, and I doubt whether a magnet suspended and movable could be used as effectually and safely as having the patient move his head and eye in the direction desired."

The writer supplements his paper with observations made during a recent trip to Europe: "First, whilst in London both Mr. Lawford and Mr. Treacher Collins of Moorfields gave me accounts of cases that had come under their care, where with very powerful giant magnets, they did not succeed in dislodging the foreign body within the

eye. They had Mr. Mackenzie Davidson use X-rays for them, and through this the foreign body was located, the eye was cut down upon at the point designated by the X-ray and the foreign body promptly removed, in one of the cases with the hand magnet. This would tend to make us more careful with regard to our diagnosis of the presence or absence of a foreign body in the eye, as made with the giant magnet, and to resort in doubtful cases more frequently to X-ray methods of examination.

"Secondly, in England, as far as I am aware, the sideroscope, either in the new or the old form, is not at all in use. I satisfied myself at the clinic of Prof. Axenfeld in Rostock that even Asmus' original sideroscope, if properly located, can be promptly relied upon to discover the presence of even a very minute foreign body within the eye. I also found that in Prof. Hirschberg's clinic the same result may be reached by the modified instrument in rather less favorable outside conditions, as far as noise and nearness of electric currents are concerned.

"Thirdly, Prof. Hirschberg, who was exceedingly kind in showing me his magnet room, evidently inclines to consider favorably the use of powerful magnets in a large number of cases, and has stated in numbers 19 and 21 of *Deutsche Medicin, Wochenschrift*, 1901, that he is now using one constructed by Hirschmann, which is even more powerful than Haab's giant magnet."

The writer describes an enlarged and improved Hirschberg hand magnet which he considers an extremely useful instrument; though considerably larger than the old hand magnet it can be conveniently used with one hand by the surgeon; it can be moved about readily and may be applied while the patient is lying down; it is operated by means of the constant street current; its power is surprisingly great; whilst weighing only two k. g., it will, with its large conical tip, carry 14½ k. g. "Combined with a proper resistance coil, I use it now on the same conduit which furnishes me the current for Haab's magnet, and with the use of a suitable plug and taking the resistance coil along, it can be safely used from an ordinary electric light socket, provided the socket is fused heavily enough to conduct two ampères."

The writer made practical tests of the efficacy

of the old Hirschberg hand magnet, of the new Hirschberg hand magnet, and of the Haab giant magnet, respectively, to ascertain the attractive power upon small and large metallic foreign bodies. His results show that "in practice Hirschberg's new large hand magnet will prove of much use, as with its biggest tip it is about five times as strong as his older small hand magnet, and will develop considerable distance traction, whilst even tip No. 9, one of the finest that could be introduced *into* the eye either through the enlarged initial lesion or through a sclerotic meridional section, will still attract an exceedingly fine bit of metal at 2.5 centimetres. It will be well to try the large hand magnet before using Haab's magnet, and undoubtedly both instruments will find separately or conjointly, their useful spheres."

A Report of Nine Cases in which Haab's Magnet was Used for the Extraction of Foreign Bodies from the Eye.

Spicer, W. T. Holmes, and Maccallen, A. F., London. (*British Medical Journal*, Jan. 18, 1902.) The writers give the histories of nine cases of magnet extraction and add comments in each case. Two of the cases recovered with V 6/9; one with V 6/12; three with V. 6/60 with a possibility of further improvement by needling; in all these cases projection was good. In three cases the eye was lost.

The following general conclusions are added:

"1. When the patient is brought up to the magnet it is the rule for severe pain to be experienced by him if a magnetisable particle is present in the globe. Haab's magnet is therefore of valuable diagnostic service in determining the presence or absence of a magnetisable particle.

"2. Localization by the X-rays is extremely important. By their means it is possible sometimes to avoid injury to a clear lens in the extraction of a foreign body, and entanglement in the iris can be avoided if its precise situation is known. Nevertheless if some delay is unavoidable before the X-rays can be applied, we advise in certain cases immediate extraction of the foreign body by Haab's magnet without precise localization; for example (1) in which there is considerable inflammation; (2) in which

there is a recent traumatic cataract. In each of these cases there is considerable danger in delay.

"3. If there is a recent wound we attempt to remove the foreign body through it, using Haab's magnet alone. If this wound has firmly healed it is necessary to make an opening for its exit. This may be either corneal, in which case the foreign body is withdrawn by Haab's magnet; or peripheral, in which case we usually employ the small magnet for the romoval of the foreign body from the anterior chamber after it has been brought forward by Haab's magnet. The latter method is the one we generally adopt.

"4. In all cases it is most essential that entanglement of the particle in the iris and ciliary body should be avoided. By bringing the patient up to the magnet gradually from a distance, and by increasing the strength of the current up to the maximum slowly, this is to a certain extent guarded against. The idea of this maneuver is to prevent the particle from rushing forward from its posterior position and burying itself in the iris."

Results of X-ray Diagnosis and of Operation in Injuries from Foreign Bodies in the Eye.

SWEET, WILLIAM M., Philadelphia. (*The Phila. Medical Journal*, Feb. 1, 1902.) The writer refers to his description of a method of locating foreign bodies in the eye by means of X-rays in 1897. Since that time he has made 102 such examinations; in 65 of these a foreign body was located in or around the eye; in 57 of the 65 the foreign body was in the vitreous.

"Of the 61 cases in which the body was situated in the eyeball, an attempt was made in 45 cases to extract the substance, which was successful in 38 cases and failed in 7 cases. In 32 instances the metal was extracted by the Hirschberg magnet, once with the Haab magnet, and five times with forceps. In 5 of the cases of failure to extract the body, enucleation was at once performed, while in the other 2 the eyeball was not removed. In 6 cases in which the body was successfully extracted, enucleation was required at a later date. In no instance was sympathetic inflammation present at the time of operation, nor did it subsequently occur. In 16 cases extraction was not attempted, the eyeball being enucleated in 9 cases, of which

3 contained steel, 3 small shot, and 3 copper. In 4 cases the steel still remains in the eyeball, while in 3 cases the patients refused operation and their subsequent history is unknown."

The percentage of successful extractions would have been greater had the foreign bodies been removed a few hours after the injury; much valuable time is often lost in delaying the operation, the entrance wound closes and the body becomes imbedded in exudate, thus rendering extraction uncertain if not fatal to the usefulness of the eyeball.

"Were the cases of iron or steel in the eye seen before the wound of entrance had closed, and if the position of the metal is known, the employment of the Haab or similar form of large magnet to withdraw the body along the path it entered would be the ideal treatment. In a certain proportion of cases where the metal has passed through the cornea, wounding the iris and lens, less damage will be caused by making a new opening in the sclera for the removal of the body than to withdraw it through the structures it passed in entering the globe. In a majority of cases of bodies in the choroid and vitreous, extraction was through a scleral opening between the external and inferior recti or the internal and inferior recti. Before making a scleral incision it is advisable to dissect up a flap of conjunctiva, and stop all hemorrhage before opening into the vitreous. The stitching of this flap in place serves to cover the scleral opening and prevent the escape of vitreous.

"The situation and direction of the wound of entrance is not a safe guide as to the position of the foreign body in the eye. Sometimes the force with which the steel strikes is sufficient to cause it to pass in a straight line from the entrance wound across the eye and lodge on the opposite side. In other instances the body, after penetrating the external structures, drops to the bottom of the vitreous.

"The use of the small magnet is never justifiable unless the position of the body is determined with some degree of accuracy. Since the magnet point must come in contact with the particle of steel to insure its removal, some definite knowledge of the position to place the magnet must be had to prevent the injury which results from its

frequent passage through the vitreous. It is even a question whether the passage of any magnet into the vitreous is not more harmful than the use of a larger magnet to draw the metal to an opening made in the sclera. It is interesting in this connection to note the excellent visual results in the several cases in which no attempt was made to extract the steel, but it must be remembered that eyes containing foreign bodies are never free from danger."

Regarding the accuracy of X-ray localization the writer says: "So far as the findings in the cases here given could be verified by the extraction of the foreign body or after enucleation, the substance was in every instance situated at the spot indicated by the radiographs. The method of localization employed is simply the triangulation of the shadow of the foreign body from two different positions in relation to the shadows on the photographic plate of two known points, so that accuracy in the results must follow with proper care in working."

Dr. Sweet tabulates the 65 cases and places them in groups according to the part of the eye in which the foreign body had been lodged. From the study of the groups of cases given, he arrives at the following *conclusions:*

"1. The Röntgen rays offer the most certain method of detecting and locating foreign bodies in the eye.

"2. The position of the foreign body should be determined in all cases before magnet extraction is attempted. Frequent insertion of the small magnet into the vitreous in the hope of finding the metal injures the eye and renders later attempts at extraction difficult, while the employment of the large magnet is not without danger when the position of the body is not known.

"3. Early extraction offers the best chance of saving the eye. When the track of the body is through the cornea and lens, its position in the vitreous will indicate whether less damage will be done by removing the metal through the open entrance wound or through a new opening in the sclera close to the indicated position of the body.

"4. The more extended use in the future of the larger magnet in cases of steel in the vitreous chamber to draw the metal to an opening in the sclera, after its position has been accurately determined, will probably achieve better

visual results than have been obtained in the past with the small magnet introduced into the vitreous.

"5. Iron or steel which has remained in the eyeball until a fibro-cellular covering envelops it cannot be dislodged with the magnet. Extraction with forceps, and the employment of normal salt solution to replace any vitreous lost, has resulted in several instances in eyeballs of good cosmetic appearance, and is an operation worthy of trial. Forceps extraction must also be employed when the body is of copper or glass.

"6. Extraction is a safe operation, and under proper precautions is free from the dangers of panophthalmitis or meningitis."

A New Localizer for Determining the Position of Foreign Bodies in the Eye by the Roentgen Rays.

Fox, L. Webster; Philadelphia. (*The Phila. Medical Journal*, Feb. 1, 1902.) "Having experienced, in my surgical practice, much difficulty in determining the exact position of foreign bodies in the human eye by means of the Röntgen photography, I have devised a new instrument which does the work in a far more efficient manner than has heretofore been possible. As is well known, the location of foreign bodies by means of the Röntgen rays is possible only when such bodies are either partially or completely opaque to the rays. If a photographic plate is placed in the path of the rays, the shadow of the opaque body is projected on the photographic plate, and its position is determined by means of the position of the shadow of the body, as compared with the position of the shadow of recognized parts of the body by which it is surrounded.

In a body so delicate as the eye, sunk as it is far in the orbital tissue, considerable difficulty has been experienced in determining from some finder or localizer, opaque to the Röntgen rays, placed outside of the eye, the exact position of the foreign body. In order to minimize this difficulty I have devised a localizer which comes directly in contact with the anterior half of the eye, and its geometrical shadow, thrown on the photographic plate, aids in locating a foreign body in the orbit or eyeball. This is especially so since I have formed the outside rim of the localizer of an opaque substance, so that, if care be

taken, the position of the eye will be clearly determined by the geometrical shadow of the localizer. The apparent position of the foreign body will be largely affected by its distance from the photographic plate, and it is exceedingly necessary that the direction of the rays, and the position of the plate, be borne in mind when interpreting from the skiagraph the exact location of the body sought for.

"The localizing device consists of an oval band of gold or silver, about 0.75 mm. in width, so shaped and curved as to conform with the outline of the eye, and provided with two gold strands crossing in front at right angles, thus dividing the instrument into quadrants. I sometimes form the localizer of a slightly different shape using two nearly concentric bands or circles with cross-wires connected thereto, leaving, however, a round or clear space for the cornea. Generally, however, I have obtained the best results with the form first described. My latest modification of the instrument is substituting for the outer band one of lesser diameter. This device accomplishes the same localization with less shadow. The foreign body must be very minute to be eclipsed by the shadow made by this localizer.

"When in use, the localizer is adjusted directly to the surface of the injured eye—a solution of cocain having been previously applied to the conjunctiva to produce anesthesia of the cornea and eyelids, thus permitting the instrument to remain in place long enough to have one or two skiagraphs taken without any inconvenience to the patient.

"The localizer adjusts itself to the eyeball, but does not prevent the eye to which it is attached, from rotating or following the other eye. In order to bring the crossed wires directly over the centre of the cornea of the eye to be photographed, it is necessary to direct the sound eye at a fixed point. The photographic plate being adjusted on the side of the temple nearer the injured eye, the Crookes' tube is then adjusted so that the Röntgen rays shall, as nearly as possible, fall perpendicularly on the surface of the photographic plate. If the foreign body lies within the shadow of the localizer, it must be in front of the equator of the eyeball; its distance behind the

shadow of the instrument also determines its location, either in the posterior portion of the globe or orbit. A control test by the occipito-frontal view at once identifies the quadrant in which the foreign body lies.

"It will be noticed in the skiagraphic pictures that some outlines of the localizer are sharper or clearer than others. In all cases the clearer outlines of the localizer will indicate the position nearest the photographic plate. To a certain extent, therefore, the position of the foreign body can be judged by the sharpness of its shadow. Its absolute location may be verified by a second or control test. This test is made by placing a plate, not on the temporal side, but in front of the eye, and having the X-ray to pass through the head. This second or occipito-frontal skiagraph is not clearly outlined in detail as the first or temporal skiagraph, but with very little experience one can recognize any foreign body seen in the first test. The one defect in the temporal picture is that if the foreign body is very small, and should lie directly below the shadow of the localizer so that it cannot be seen, then an additional temporal occipito-frontal picture must be taken or an additional temporal picture must be taken with the source of the rays at a diverging angle and no longer perpendicular, as in the first instance."

A Secure Advancement Operation Performed With the Aid of a New Tendon Tucker.

Todd, Frank C., Minneapolis, Minn. (*Ophthalmic Record*, Feb. 1902.) The writer describes a new tendon tucker which he has devised and then gives the following description of his method, which, he says, is a combination of the ordinary tucking operation and the advancement performed by Noyes: "Supposing the internal rectus was to be advanced. A flap of conjunctiva and Tenon's capsule is dissected up and turned back in such a manner as to freely expose the tendon. The prongs of the tendon tucker being crossed (the one toward the internal canthus should cross above the other) the prong now toward the internal canthus is placed under the tendon, the nut is then turned on the screw until the prongs are separated enough to produce the desired effect. The tuck having now been taken, catgut sutures are inserted through the three layers of tendon, one at the upper and one at the

lower border. These are tied. Then a double threaded black silk suture is passed through the loop in the tendon, from the under surface outward and then on through the conjunctival flap, from within outward. The needle at the other end of the suture is now buried under the conjunctiva below the cornea and into the episcleral tissues, coming out near the lower margin of the cornea. A like suture is inserted above, the instrument is removed, and each silk suture tied. These extra sutures act as guys to anchor the tendon while healing takes place, giving the operator a sense of security he does not always feel in advancement operations, and incidentally serve to fasten the conjunctival flap.

Implantation of a Gold Ball for the Better Support of an Artificial Eye.

Fox, L. Webster, Philadelphia. (*The New York Medical Journal*, Jan. 18, 1902.) Five years ago the writer devised a method of implanting a glass ball into the orbital cavity in cases where the eyeball had previously been removed. Following the description of his first operation, Fox mentions the defects and the way in which these were remedied. "The satisfactory wearing of an artificial eye over this stump is vouched for by many patients. The filling up of a deep socket, the prevention of incrustation in, and also over, the artificial eye, the absence of retained secretions, as well as the sunken and immobile eye giving a sinister stare to the patient, led me on to perfect this operation, until now no failures need be recorded, and all the defects described above, avoided.

"It is now six years since I implanted the first glass ball in a patient where the eye had been removed twelve years before. Eighteen months ago I devised the present method, which I can now safely recommend.

"If the operation is to be performed in the right orbit I carry out the details as follows: The eyelids are kept apart by a speculum, the conjunctiva is then grasped up and in above the inner canthus, and the tissues are well pulled out. I then pass a Beer's knife or a curved keratome through the tissues, somewhat obliquely and well down into the orbit; this opening must be made large enough to push the globe in the opening behind the tissues, conjunctiva, etc. This starts the opening, which I enlarge with

curved scissors, separating the tissues from the cellular tissues around the orbit, thus giving me a large pouch into which the globe can be inserted. I have discarded glass and silver balls and only use gold balls of 11, 12, 13 and 14 millimetres in diameter.

"The gold ball is inserted through the opening and retained in place by a shell which I have modelled after an artificial eye, and which I call a 'conformer.' I have three sizes for various sized orbits. I close up the incision with two stitches, then place the conformer over the buried ball, and by gentle manipulation on this metal rotate the ball into place. The circular opening in the conformer allows the gold ball to fit the space which will be covered by the cornea of the artificial eye.

"The eyelids are then closed over the conformer, which is left in place twenty-four hours. The eyelids also help to keep the ball in place. I have these conformers made of metal, gold plated. The results obtained by this method are perfect; no secondary trouble follows, all healing up by first intention, and the two stitches are taken out on the third day.

"It can be readily understood now that the gold ball cannot break through the centre of the conjunctiva, and, as the opening is out of line of pressure, it soon closes up. If the operation is to be performed on the left orbit, the incision is to be made up and out above the external rectus muscle, and the dissection carried out as described above."

Empyema of the Frontal Sinus: Some Observations on its Treatment.

Richards, Geo. L., Fall River, Mass. (*Amer. Jour. Med. Sciences*, Mch., 1902.) The writer's paper, based more on his own observations than on an exhaustive survey of the literature of the subject, begins with a brief review of the anatomy of the frontal sinus.

The danger to life from a collection of pus in the frontal sinuses is regarded as relatively small; deaths from chronic empyema of the frontal sinus are explained by anatomical anomalies, secondary infection after operation, and unusual virulence of the pus. Many cases, with constant discharge of foul pus, occur in persons in good general condition, who seek relief on account of the nasal obstruction and the foul odor.

"Aside from the symptoms of pain and headache in the neighborhood of the sinus, and the complaint of nasal obstruction, the diagnosis is made by inspection of the discharge, which appears underneath the middle turbinate or between it and the septum, and by exclusion of the other possible sources from which this pus might come. Pressure upward on the wall of the orbit will usually elicit pain, though this is not constant. Disease of the antrum and the sinus may coexist, and in many cases it may be necessary to make an exploratory incision into the antrum to exclude that as a possible source of the pus. If the exploratory puncture of the antrum has been negative, we then have the anterior ethmoidal cells and the frontal sinus as the possible sources of the pus. The diagnosis here may possibly be very difficult. Transillumination, while by no means decisive, has seemed to me of some value as a diagnostic measure. It certainly is, as far as antrum disease is concerned; and in two of my frontal sinus cases the information furnished by transillumination was positive and accurate."

The writer points out the difficulties often encountered in passing a probe into the frontal sinsus (swollen mucous membrane, enlarged middle turbinate and polyps) and the necessity of clearing away any obstruction, including as a rule the anterior extremity of middle turbinate.

"The acute cases tend to get well if the drainage is free enough; and on their first discovery the middle turbinate should be removed and the drainage made as free as possible. After this is done, it is frequently comparatively easy to find the track up to the frontal sinsus, and with the aid of a silver or hard rubber tube, properly bent, to wash out the sinus, and in a relatively short time to bring about recovery. The proper curve of the tube is obtained by first passing a long silver probe and then copying its curve. In cases of this class the question of an external operation ought seldom to occur, and the diagnosis is usually not a difficult one to make or to differentiate from ethmoiditis or antrum disease, since the attack is acute, is accompanied by pain over the eyes and forehead, and the whole clinical picture is one that admits of comparatively little doubt as to the trouble."

In the large number of cases in which the purulent discharge has lasted a long time, in which polypi have formed, and all the adjacent ethmoidal cells are very likely involved, the question of treatment becomes less easy to decide. Richards gives the history of an extreme case, in which a number of operations resulted in marked improvement but not in absolute cure, to show the difficulties encountered in some examples.

The writer asks whether any of the chronic cases can be cured by intranasal operation. Hartman thinks it will but seldom occur that they can, and that an external opening should be made when, after a fair trial of intranasal drainage, the discharge continues and there is still pain. Most of the chronic cases get some relief after removal of the middle turbinate and are then somewhat loath to consider the question of an external operation, fearing deformity and dreading the length of time required for healing; these objections the writer considers unwarranted, since the time for healing is very much shortened if a sufficiently large opening is made down into the nose, and the deformity trivial when the operation is done at the inner angle of eye, under the infraorbital ridge. "The washing out of the sinus, even after removal of the turbinate, is still difficult, since the outlet is small; and if polypi or granulations are present in the sinus no cure will ever be effected until an external opening is made." The writer prefers solutions of corrossive sublimate, 1:10,000 to 1:15,000 for syringing into the sinus.

"I should say, then, that after spending a reasonable length of time in the attempt to gain proper intranasal drainage by syringing and douching, the question of an external operation should be presented to the patient and he be allowed to make the choice. He will be very likely to ask if we know that there is pus in the frontal sinus, and if a cure will result; and to both of these questions we may be in doubt as to the answer." A cure will probably result sooner or later, but how long it will take, will depend on the extent of bone involved, and this is difficult to determine before the sinus has been exposed. There is, however, no certainty that a cure will always result, even after the so-called radical operation.

Richards quotes the opinions of Thompson, Tilley,

Semon and Lack, expressed at a meeting of the Laryngological Society of London in 1901, all of which are in favor of the more conservative methods of dealing with these cases intranasally, but he believes that the discussion leaned rather to the extreme of conservatism.

"In the final analysis the question of operation must depend in each individual case upon symptoms, such as recurring attacks of pain and cerebral irritation, which suggest dangers to the organism from septic absorption; and upon the judgment of the operator and the confidence reposed in him by the patient. In many persons the question of confinement, or the length of time they will be kept from work, will have a large influence, and they will prefer to endure the discharge of pus which is not producing alarming symptoms rather than be kept from their daily vocation long enough to procure a cure."

The writer is opposed to the radical operation proposed by Hartmann; the question of scar is one not to be lightly passed by.

"From my own experience I prefer always to make the opening between the supra-orbital notch and the root of the nose underneath the ridge. Whereas the wall of the sinus is comparatively thick at this point, the sinus itself when opened is as roomy as at any place, and the bone opening is easily enlarged upward as far as the upper border of the ridge, and outward, so as to give a sufficient amount of room to enter a fairly good-sized curette and explore every part of the region. While the fronto-nasal canal is easily accessible at this point, it is at the same time also the most dependent portion of the sinus. So long as the upper border of the supra-orbital ridge is left the resulting deformity is practically nothing, as the new growth of the eyebrow takes care of the scar.

"Before beginning the operation the post-nasal space can be plugged, to prevent the swallowing of blood. A string should be attached to the plug, one end being brought out through the free nostril and the other out of the mouth. After shaving the eyebrow and properly preparing the surface, a circular incision is made from just inside the supra-orbital notch and along the lower third of the eyebrow as far as the root of the nose or a little below. The periosteum is laid back, the bone bared, and an open-

ing made down to the sinus at the centre-point of the incision. The sinus being opened and explored with the probe, the external opening is still further enlarged as in the individual case may seem necessary. When this is done sufficiently a probe can be passed downward into the nose through the natural opening and its direction noted. This opening is then enlarged with the curette, so as to give all the room that is needed, more of the bony wall being cut away if required and in whatever direction needed; and, bearing in mind my own experience, I should urge upon the operator to make a larger opening into the nose than he thinks he needs—in fact, the largest opening possible, especially backward and outward, so as to avoid any danger of injuring the lamina cribrosa. Use small curettes at first, and larger ones if needed; those with curved shanks are preferable. The whole area of the sinus which can be reached is to be curetted and its ramifications followed up. The extent and vigor of the curetting will depend upon the condition of the mucosa and the presence or absence of granulations. As far as possible, all of the ethmoidal cells in the immediate vicinity should be opened. When using the curette in the fronto-nasal canal or in the ethmoidal region the little or index finger should be kept in the nostril as a guide, the middle turbinate having been in all cases previously removed.

"I have tried gauze wicking of good size as a means of keeping the fronto-nasal canal open, but do not like it, as it is very painful to remove. Drainage is best attained by means of rubber tubes slightly fenestrated, one end of which presents at the external wound and the other out of the nostril. These may be changed every other day, the new one being readily attached to the old one by carrying a needle with a long thread twice through each one and leaving the threads, cutting out the needle at the eye. The old tube is then drawn down, the new one follows it, and the threads can be cut off. The advantage of putting the thread through twice and then leaving it long is, that if there is any interference on the way and the rubber pulls the threads might pull out and the following tubes be lost; but if the threads are sufficiently long the following tube will not be lost, and the first one can be drawn back in case the second tube will not follow, and a smaller tube

can be used. These tubes should be retained as long as may be necessary, certainly two or three weeks. After that time if a tube is required it is better to use one of silver, properly curved. At the time of operation a stitch is put at each side of the wound, leaving an opening sufficiently large for the drainage-tube. In cases which have lasted but a short time, if the opening into the nose is very large, it may do to close the external wound; personally, I prefer to keep it open for a while, when if the case progresses well the tube can be removed and the opening allowed to close. As the incision is a curved one, when the tube is finally withdrawn the tendency is for the opening to close perfectly, leaving only a slightly depressed scar, completely covered by the eyebrow and not noticable in any of my cases except on close inspection. When the opening is made on the forehead above the ridge there is more likelihood of an unsightly scar, if it cannot be closed at once and perfect apposition obtained; there is also more likelihood of a depression than when the opening is made at the angle of the eye. The only possible advantage of opening above is that the opening down into the nose is rendered straighter. I think, however, that this advantage is more theoretical than real. If the operator was certain that he had removed all the diseased mucous membrane, and that the outlet into the nose was sufficiently large, the external wound might be closed at once; of this, however, one cannot be sure."

There will be considerable swelling of the loose tissue about the eye after any external operation, but this lasts only a few days. The after treatment will depend upon how thoroughly the disease can be eradicated at the first operation. In many cases recovery will be prompt; in others final healing will be tedious and there may be some discharge of pus for some time. The time required for a cure varies according to the severity of the disease, from a few weeks to several months.

Besides the operation explained above, the writer briefly describes a number of other procedures for the cure of empyema of the frontal sinuses which bear the names of their originators; these include the operations of Nebinger-Praun, Jansen, Ogston-Luc, Czerny, Kuhnt, Killian, and Spiess.

The Diagnosis of Latent Frontal Sinusitis.

SHAMBAUGH, GEO. E., Chicago, Ill. (*Amer. Journ. Med. Sciences*, March, 1902.) The cases of frontal sinusitis may be devided into manifest and the latent varieties; the former, in which the imflammatory product seeks an outlet through the walls of the sinus are comparatively rare; in the far greater number of latent cases, the disease produces no outward symptoms and the only abnormal conditions are the secondary changes produced by the pus where it is discharged into the nose, with, perhaps, a few uncertain subjective symptoms. This condition often passes unrecognized, unsuspected and is generally considered to be the most difficult to demonstrate of all the accessory sinus diseases.

Latent frontal sinusitis often lasts for years, with intervening acute exacerbations, giving rise to symptoms which, while not positive, should at least lead us to suspect this condition. Among these symptoms, frontal headache, either dull or throbbing, is the most constant; when characteristic, this is of an intermittent type, coming on in the morning at a regular hour and disappearing toward the middle of the day; the headache is often relieved by the application of cocain about the orifice of the duct in the middle meatus; though often characteristic, frontal headache is not a positive diagnostic sign in frontal sinus disease.

Tenderness on pressure often felt over the affected sinus is of greater diagnostic significance; this can sometimes be felt over the entire anterior wall, sometimes only over the orbital wall. But this symptom often fails when the intranasal examination shows the presence of pus in the sinus; on the other hand marked tenderness is occasionally found over a normal sinus.

The results of trans-illumination are apt to be negative.

In cases of long standing, secondary degenerative changes of the mucous membrane are often found about the orifice of the naso-frontal duct in the middle meatus; the anterior end of the middle turbinated body is frequently found in a state of polypoid degeneration; the point opposite, on the septum, sometimes undergoes a similar change. The appearances about the middle meatus are often characteristic; frequently one sees along the concave edge of

the middle turbinated body, a red, edematous area; a drop of cocain applied to this point will be followed by a partial reduction of the edema, and often by a suspension of a severe frontal headache. The inflation of the sinus by the Politzer method is often followed by striking relief.

"A continuous discharge of pus into the middle meatus has been considered a valuable indication of frontal sinus empyema, for the opening, being at the lowest point of the sinus, does not allow the secretion to accumulate. The antrum of Highmore, which also drains into the middle meatus, has its opening at the very top, so that secretion accumulates in the sinus until a change in the position of the head favors its outflow, when it is poured in quantity into the nose. A continuous discharge of pus into the middle meatus may come from the anterior ethmoid cells, the frontal, or the infundibular cells, as they drain directly into the anterior end of the infundibulum.

"On the other hand, discharge from the frontal sinus is often intermittent when only a limited amount is secreted, giving rise to the well known morning discharge of pus which accumulates while in the horizontal position. This is followed by cessation of discharge for a number of hours. An intermittent flow may also be caused by a partial obstruction of the duct by polyps. The secretion accumulates behind this barrier until the pressure is sufficient to force open the passage, when a considerable quantity is discharged at once, followed again by a period of retention.

"It is evident that whether all of the above symptoms fail in a given case, or whether part or all of them are present, we can neither positively exclude frontal sinus disease nor positively diagnose its presence. *The final diagnosis of latent frontal sinusitis must rest upon demonstration of pus in the sinus.*"

In passing from the frontal sinus to the nose, pus may take a *typical* passage (through the nasofrontal duct into the anterior end of the infundibulum, then through the hiatus semilunaris into the middle meatus); or it may seek an *atypical* route, passing directly from the sinus into the middle meatus at a point in front and a little to the median line of the hiatus semilunaris. If the middle meatus is free from polyps and the middle turbinated body stands well out from the outer wall, we may proceed at once to

the examination of the naso-frontal duct and to the introduction of the catheter into the sinus; but when obstructions exist these must be removed—snaring of polyps or resection of the anterior end of the middle turbinated body. The latter procedure not only opens the way for inspection and catheterization, but is the key to the conservative intranasal treatment of many cases of frontal sinusitis, serving to establish free drainage.

With the middle meatus freely opened, there are three methods of determining the presence of pus in the frontal sinus: 1. Introduction of a catheter and irrigation of the sinus. 2. Diagnosis by exclusion. 3. Exploratory opening into the sinus.

Catheterization of the Frontal Sinus. The middle meatus having been anesthetized with cocain, the exact location of the orifice and the direction of the passage is determined with a flexible blunt-pointed probe. "Bending the probe one inch from the tip at about a right angle upward, try to introduce it by the typical passage through the infundibulum upward and forward. If this fails, try to reach the sinus through the direct or atypical passage at a point in front and a little to the median side of the hiatus semilunaris, changing the curve of the probe to suit the direction of the passage in the particular case."

The writer describes the obstacles encountered in passing a sound into the frontal sinus (curvature of the septum, anterior end of the middle turbinated body, polyps, narrow infundibulum, excessively large bulla ethmoidalis, infundibulum opening into a frontal cell)—requiring many trials at repeated sittings. Following the successful use of the probe, the introduction of the catheter is a comparatively simple matter, a soft silver catheter being bent to correspond exactly to the curve of the probe. It is sometimes difficult to ascertain whether the instrument has actually passed into the frontal sinus. To obviate this difficulty Shambaugh uses the X-rays with satisfactory results, though there is a possibility for error even with this method, since the catheter may enter a large frontal cell; in such a case, we can, in some cases, differentiate by means of the ability to rotate the tip of the instrument freely. With the catheter in the sinus, it is a simple matter to irrigate the cavity and examine the water for the

presence of pus, repeated examinations being sometimes necessary.

Diagnosis by Exclusion. In the cases in which the catheter cannot be introduced, diagnosis by exclusion may be tried. "The maxillary sinus and the anterior ethmoid cells as well as the frontal sinus open into the middle meatus. Pus found in this meatus may have come, therefore, from one or all of these cavities. To determine whether a part or all of the pus comes from the frontal sinus we proceed first to eliminate the maxillary sinus. This is done by irrigating the sinus either through its normal opening or by introducing a curved trocar just above the inferior turbinated body. The point of the trocar should be directed down and outward in order to avoid the orbit. After the sinus has been washed out the nose is thoroughly cleansed with a pledget of cotton. The patient is now allowed to wait ten or twenty minutes. If pus is again found in the middle meatus it must come either from the anterior ethmoid cells, or the frontal sinus. The opening into the anterior ethmoid cells, placed in the angle between the bulla and the base of the middle turbinated body, is separated far enough from the ostium frontalis so that pus coming from the former can often be distinguished from that coming from the opening of the nasofrontal duct.

"In latent empyema the discharge from the frontal sinus is often intermittent, due to a partial obstruction of the duct or to the slight amount of pus secreted. In such cases, therefore, where the pus does not reappear after cleansing the nose, a piece of dry gauze may be packed about the ostium frontalis and left there for several hours, or even over night. Upon its removal, if any pus has exuded from the frontal sinus, the gauze will be marked with it. A negative result, just as when catheterizing the sinus, cannot be considered conclusive until repeated examinations show its absence."

Exploratory Puncture. This method is to be resorted to in cases in which the above described procedures fail to give satisfactory results. The danger of entering the brain cavity in puncturing the sinus from the nose is so great that few specialists care to undertake it. The safest method is to make the opening from without; a small incision can be made under the inner end of the eyebrow,

leaving a slight scar which cannot be seen; in such cases, it is well to get the consent of the patient to complete the operation of cleaning out the sinus, in case pus should be found.

The Class of Cases of Simple Chronic Glaucoma in Which Operation Is Not Advisable.

BULL, CHARLES STEDMAN, New York. (*Medical News*, Jan. 18, 1902.) The writer regards simple chronic glaucoma as a disease in many respects essentially different from glaucoma with exacerbations. He calls attention to the fact that the symptoms which are supposed to characterize simple chronic glaucoma, viz., reduction of vision, narrowing of the visual field, excavation of the optic disc, are not characteristic of the disease, for they are all met with in simple atrophy of the optic nerve. He says: "I am inclined to think, partly from my own experience and partly from the expressed opinions of some of my colleagues on the subject, that the unfavorable view taken of operative procedures in simple chronic glaucoma is often due to our errors in diagnosis. We must learn to distinguish absolutely between simple chronic glaucoma and a diseased condition of the optic nerve with pre-existing physiological excavation, and the distinguishing sign is the increase of the intra-ocular tension. Without this *increase of tension* there is no *glaucoma*. Here is the great difficulty, for in simple chronic glaucoma the increase of the intra-ocular tension is often so slight as to be far from easy to recognize, and in these cases we may readily confound the disease with atrophy of the optic nerve. Moreover, in this form of glaucoma increased tension is not constantly present, and may be absent for hours and even days in succession. In fact, as we know, the disease presents no active symptoms and it is difficult to fix the date of onset. These periods of increased tension should be searched for with the finger-tips placed on the sclera itself and not on the closed lids. I make the examinations frequently at different hours of the same day or different days. I think we are justified in saying that in every case of simple chronic glaucoma there is a slow but progressive increase in the tension, not always to be recognized at first, but which becomes demonstrable after repeated examinations."

He points out the seriousness of confounding these two

diseases with each other, for the false glaucoma should never be attended surgically, and in a case of true glaucoma we might deprive the patient of the proper remedy; this may explain the failure of both iridectomy and sclerotomy to bring about a cure in all cases in which tension is not increased, these operations exerting no effect in reducing normal tension, but producing this effect only in cases in which the tension is increased. In studying cases of glaucoma, we may gain assistance from observing the condition of the angle of the anterior chamber; this is wide in emmetropic eyes, narrowed and pointed in hypermetropic eyes, rounded and wider in myopic eyes.

Repeated study of the field of vision is often valuable in helping a decision for or against operative interference. The defects in the field in glaucoma are often peculiar; diseases of the retinal vessels sometimes cause defects analogous to those found in glaucoma; typical nasal contractions are not always found, for there are frequent exceptions. If the visual field on successive days and at repeated examinations is contracted on the nasal side or concentrically, we may be sure that the disease is progressing. The existence of scotomata aids us in forming a prognosis in simple glaucoma; they are frequently the forerunners of subsequent peripheral defects in the visual field; they are different from those met with in atrophy of the optic nerve.

The prognosis depends on the type of the disease, the stage of its development, and the amount of degenerative change in the retina as measured by defects in the visual field. Some idea as to the result of an operation in a given case may be obtained from the condition of the iris and its reaction to myotics.

"The most important point in the management of chronic glaucoma is that our *diagnosis* should be *correct*, and we should be careful never to base our diagnosis upon the presence of one or even two symptoms, but we must look for them all, even if we are forced to reserve our diagnosis until the patient has been examined a number of times."

The study of the disc is often misleading and of little value for differential diagnosis, since the atrophic excavation of simple atrophy implanted on a physiological cupping may produce an ophthalmoscopic picture resembling

that of a cupping due to glaucoma. The condition of the iris and pupil is not always diagnostic; the case may go on to blindness without affecting the reaction of the iris to light; the pupil may be perfectly round and yet the iris be dilated and movable. Nor is the condition of the anterior chamber always diagnostic. It is a mistake to make the diagnosis of glaucoma from the presence of arterial pulsation; the latter is a grave symptom indicating the possible occurrence of retinal hemorrhage after iridectomy.

"The question of tension is probably the most difficult one to settle in chronic glaucoma. Schweigger says that there are *physiologically hard* and *physiologically soft* eyes, and that he does not recognize any normal limit for the tactile hardness of eyes, because the resistance to the finger depends not only on the intra-ocular pressure, but also on the resisting power of the sclerotic, which is very different in different individuals and at different points. In simple chronic glaucoma the increase of tension is very apt to appear in a sudden attack, which at first lasts a brief period and then disappears; but as the disease becomes more chronic, the increase of tension occurs more frequently and lasts longer, until in the pronounced cases it is a permanent feature."

The writer's experience with sclerotomy has not been satisfactory, and his remarks on operative intervention are confined to iridectomy: "Simple chronic glaucoma should always be operated on early in the disease, before much contraction of the field has occurred. The operative effect of iridectomy is more certain and undeniable the earlier it is done. The slightest narrowing of the field, whether for form or color, demands operation once our diagnosis is made. The curative action of iridectomy stands in direct proportion to the increase of tension. Early iridectomy, while the iris is still mobile, the field but little contracted, and the cupping of the disc slight, commonly arrests the disease, at least for a prolonged period, and preserves what sight remains. *Done early*, it offers the best prospect for the arrest of the process, and its effects are either permanent or very prolonged. If the tension is lowered after iridectomy, a favorable result is to be expected. If the tension remains high after operation, we must look for an unfavorable result. If, under the use

of myotics, the vision improves and the field widens, it is almost certain that an iridectomy will give a good result. If, in spite of myotics, the visual acuity remains stationary and the field does not improve, the effect of the operation will be less favorable. In advanced chronic glaucoma with great contraction of the visual field, marked impairment of the vision, undoubted increase of tension and deep cupping of the disc, the prognosis for operation is more than doubtful; it is distinctly unfavorable, and iridectomy should not be done. In those cases in which the contraction of the visual field has approached close to the fixation point, even though the central vision is still good, iridectomy is positively contra-indicated; for the contraction of the field is not arrested, is often made immediately worse, and may be followed by total loss of central vision."

In such cases, the writer advises eserin or pilocarpin, and remarks that in favorable instances the use of these remedies often preserves existing vision and prevents further contraction of the field for a long time; they are not effective, however, unless they contract the iris and lower the tension. Eserin, while more powerful, is apt to produce ciliary congestion and sometimes follicular conjunctivitis; the salicylate and hydrobromate are preferred, and the addition of cocain is recommended in order to overcome the tendency to ciliary hyperemia. As soon as the tension has diminished, pilocarpin is substituted for eserin; if the tension increases, eserin is again resorted to. Morphine hypodermatically may be of advantage. Besides myotics, gentle massage of the globe twice a day is often useful. Any error of refraction should be carefully corrected. The habits of life of the patient, and general and ocular hygiene should be regulated. Frequent periods of rest of the eye, avoidance of constipation, regular hours, sufficient sleep, avoidance of anxiety, and the correction of any existing gouty or rheumatic tendency should all be looked after.

The Economic Limitations of the Visual Acuity in Various Trades and Professions.

WÜRDEMANN, H. V., Milwaukee, Wis. (*Journal Am. Med. Assoc.*, Feb. 8, 1902.) The writer calls attention to the fact that the physiological and earning limitations of central acuteness of vision are not identical; "for in-

stance, science calls an individual blind only when perception of light has entirely disappeared, but in actual practice he is blind if the faculty of sight has been weakened to such an extent that the organ of vision cannot be used to earn a living. Thus the meaning of blindness as used in daily life is much narrower than that of science.

"Now and then extremely great demands may be made upon certain organs which may reach to the highest ability. In actual practice we are satisfied with the amount of labor which does not strain the powers. There is hardly any vocation which demands the extreme limit of sight (according to scientific figures) as a condition of success, and in such trade a great many individuals may be found who have comparatively poor sight but the same earning ability as those with normal eyes. Neither the lowest nor the highest point of scientific visual acuity correspond with those used in business; the lowest point of the latter is not as low as the lowest laid down by science, while the highest point of the functional range that may be regarded as normal must be considered below the highest scientific standard."

Experience has shown that ordinary coarse work, such as that of a farmer or day laborer, does not require more than one-half the normal acuteness as a condition of success, while the skilled mechanic can do all his work with 75 per cent. of the scientific standard of normal acuteness of vision. If the laborer's vision should drop to less than 0.05, he would be blind for all working purposes, and the same might be said of the skilled artisan if his vision drop below 0.15. The writer has utilized these four limit values and has constructed two ranges within which the professional or economic limits lie. "One of these ranges would have its highest limit 0.75 (three-quarters), as the lowest 0.15 (one-seventh); while the other range would be between 0.50 (one-half) and 0.05 (one-twentieth) of the normal scientific standard for visual acuity. It is not necessary that the maximum and the minimum limit values exist in both eyes. It is sufficient that they may be shown in one eye, the other having the lesser acuity than that which we have declared as absolutely necessary for professional visual demands."

Würdemann places the followers of the different trades

and professions in two groups, according to the standards given above. "It is advisable" he says, "to reach some definite agreement as soon as possible, as hitherto there has been a disposition among oculists to consider the scientific results of the examination of the visual acuity as the basis for the valuation of the conditions arising in practical life. If the estimation of the results of the amount of damage arising from ocular injuries is to be made in a just manner according to actual condidions, this custom must be abandoned." It is important to remember this difference between the scientific and working standards of acuteness of vision not only in its bearing upon ocular injuries but also in connection with the requirements for admission to certain professions and vocations. In America the tendency is to demand the highest visual qualifications from prospective railway employes; but in Germany perfect vision is not required, but only "sufficient" visual acuity.

The writer alludes to Allport's investigations of the visual requirements of railway employes and his division of such employes into two classes. He believes that 0.75 vision should be required of new men, and that they should not have any grade of refractive error which would ultimately render their distant vision poor without glasses. A table is given showing the scientific standard for acuteness of vision converted into economic terms; this table is useful in calculating the amount of economic damage from ocular accidents. The relations between the scientific and the economic visual acuity is also shown in a figure by means of curves.

The Comparative Value of the Thorner Stationary Ophthalmoscope.

HANSELL, HOWARD F., Philadelphia, Pa. (*American Medicine*, Feb. 1, 1902.) The writer points out that this instrument can never replace the hand ophthalmoscope on account of its size, nonportability, inferiority in the study of the lens and vitreous opacities, and its indifferent measurement of refraction. These objections suggest claims which are not made for the instrument which has great merit and is almost indispensable for those interested in ophthalmoscopy and the relation of general disease to fundus changes. It is not only a means of

affording a beautifully illustrated view of the magnified fundus, in which the details and extent of the field are a revelation, but a boon to the practitioner or student who has never learned to use the hand ophthalmoscope.

"Its supplementary usefulness is shown:

"1. In teaching, one is able to demonstrate to a student, physician, or other person, satisfactorily and rapidly, the fundus of a patient whose pupil is dilated. On several occasions I have shown to 25 or 30 students of the graduating class of Jefferson College, men entirely unacquainted with any ophthalmoscope or fundus picture, except as book illustrations, in one hour or less, every detail of the eyegrounds of several patients, without difficulty and without uncertainty.

"2. In sketching or painting healthy or diseased eyegrounds, the artist's hands are free to hold the pencil or brush, and no time is lost in laying down and picking up the ophthalmoscope or in searching for the part of the fundus previously portrayed in order to make a complete picture. Moreover, moderate illumination of the room is no disadvantage. The skilful artist, without strain on his imagination, must make a true-to-life picture as readily as he would copy a slide under the microscope.

"3. In diagnosis, (a) a comparatively large part of the fundus is held under examination at one time. For example, the field includes the papilla, the fovea and the regions between and adjacent to both; or by altering the direction of the gaze of the other eye to objects in different parts of the room as they are seen through small mirrors fixed on the instrument, all sections of the fundus are successively seen. Hence, the relative size and the distance apart, as well as the exact position of all the factors that make up the picture of the fundus, are noted. (b) Since the magnification is that of the direct method, and the illumination by the small oil lamp is all that could be desired, no lesion, however small or faint, visible with the hand ophthalmoscope, can escape observation and others heretofore invisible are brought plainly into view (I have been able to discover fine granular lesions in the foveal region of a patient who was considered to have 'amblyopia without evident ophthalmoscopic findings'). These pictures have forced me to modify to a certain extent my

conception of the state of the retina and choroid in health and in some of the diseases that I have encountered. (c) The adjustment possible with the instrument for errors of refraction enables one to focus readily and quickly and with no friction."

The writer next gives in detail the appearance of the fundus, as viewed with the Thorner ophthalmoscope, in normal cases, coloboma, albuminuric retinitis, central retinochoroiditis, optic neuritis, embolism, and optic nerve atrophy.

The Practical Value of the Perforated Disc in Subjective Testing of the Refraction.

EATON, F. B., San Francisco, Cal. (*Ophthalmic Record*, Jan., 1902.) The writer finds considerable advantage from placing perforated discs with 2 1/2 mm. to 4 mm. apertures before the pupil, in subjective testing of the refraction of an eye under the effects of a mydriatic. In most eyes there is generally present a defect in the lens. called positive spherical aberration, which causes rays passing through the periphery to cross nearer than those passing through near the center. The important portion, in an accurate determination of the refraction, is the central part of the lens, this region being called by Jackson the "visual zone," and termed by Eaton the "dioptric path."

The care taken in retinoscopy to determine the refractive condition in this path and to exclude the disturbing phenomena due to spherical aberration, should also be taken during subjective tests. This is, however, practically impossible, unless we place a "stop" before the pupil when the latter has been widely dilated by a cycloplegic.

The ideal "stop" would be a very thin disc placed at the posterior surface of the cornea, having a circular perforation the size of the patient's pupil when under average illumination. Approximately, the same result can be reached by placing the perforated disc as near the anterior surface of the cornea as possible. The ordinary trial frames are not adapted for the use of this device; proper adjustment would be difficult to start with, and would be unstable on account of the movements imparted to the frame by the hand of the oculist when changing the lenses; displacement of the aperture so that its edge

wholly or partially obstructs the line of sight, would give rise to errors, especially in astigmatism. "The trial frame is quite suitable when once adjusted and unmoved. But, for the proper use of the disc, an optometer of the type devised by Risley, Oliver and others, swung from a standard attached to the patient's chair, or near by, is all but necessary, since it is provided with a forehead rest and can be readily adjusted for height, leveled, etc."

The writer gives an example of the method of subjective testing which has been employed by him for years, in order to illustrate the value of the disc. He is convinced that errors are often made by careful oculists, because they are correcting, not the refractive error in the dioptric path, but that of the periphery of the pupil when there is considerable spherical aberration.

Tuberculosis of the Eye.

HAIGHT, ALLEN T., Chicago, Ill. (*American Medicine*, Feb. 8, 1902.) After giving a history of our knowledge of this subject, the writer draws attention to the following points laid down by Ludwig Bach: "1. Tuberculosis of the eye is by no means a rare affection. 2. All parts of the eye may be attacked by the disease. 3. It plays a particularly important role in diseases of the uveal tract. 4. The eye diseases may be the only and earliest manifestation of the tuberculosis infection."

Ophthalmoscopic pictures of tuberculous deposits, Haight says, present round, whitish or yellowish-white spots of varying size. Anatomically, the single deposits are occasionally so small that they are not visible to the naked eye; sometimes they are $2^1/_2$ mm. in diameter. At first they advance toward the retina, and later encroach on the sclera; they begin in the chorio-capillaris; the uniform blanching of the pigment epithelium produces the yellowish-white spots.

Ocular disease may be the earliest and only manifestation of the tuberculous affection, and may appear in various forms—isolated or diffuse. It may resemble an ulcer or trachoma, and is known to affect almost every part of the eye, even the orbit.

The writer says the iris is the most frequent starting point of tuberculosis, spreading from this to other tunics with much rapidity. Tuberculosis of the iris is most

frequently met with between the ages of 15 and 30. Some authors believe that a local inoculation takes place in a healthy subject, through an abrasion of the conjunctiva; others believe that the initial lesion is a tuberculous ulcer of the conjunctiva. Leber agrees with Habnet and Haensell that the small, reddish nodules which develop on the iris, and which may disappear spontaneously to be followed in many instances by tubercles, are of a tuberculous nature.

Tuberculosis of the conjunctiva generally attacks one eye, almost without exception in young people. The writer gives Sattler's classification of conjunctival tuberculosis: "(1) Characterized by the presence of small miliary ulcers, which later on may coalesce, generally attacking the palpebral, sometimes the bulbar conjunctiva; (2) characterized by the presence of grayish or yellowish subconjunctival nodules, varying in size, but rarely larger than a hempseed, not unlike the sago granules of trachoma; (3) characterized by the presence of florid hypertrophied papillæ and rounded outgrowths or granulation tissue, springing from the palpebral conjunctiva or situated in the fornices, and which soon recur after removal. These granulations are accompanied by odema and thickening of the lids; (4) "lupus" of the conjunctiva, characterized by numerous pedunculated, cockscomb like excrescences in the fornices, of a jelly-like consistency, often showing more or less extensive ulceration; (5) cases characterized by the existence of distinctly pedunculated tumors, having the macroscopic appearances of ordinary papillomas, and those designated by Mitvalsky as "true polypus of the conjunctiva," cases in which there is no involvement of the subconjunctival tissue, nor the production of any subjective symptom other than slight inconvenience due to purely mechanic causes."

Haight has collected 312 published cases of tuberculosis of the eye, including four of his own. Of this number 121 were in the iris, 96 in the choroid, 57 in the conjunctiva, 13 in the ciliary body, 11 in the cornea, 8 in the lacrimal gland, 4 in the retina, and 2 in the optic nerve. In 118 cases in which one eye was effected, in about 60 per cent. the affection extended to the other; and about 40

per cent. had complete destruction of vision. Ophthalmic tuberculosis without prehistoric cause, 86; general tuberculosis in 60 per cent. of all cases. Total cases in primary tuberculosis of the eye, when it could not be found in any other part of the body, 58. In 122 cases hereditary tuberculosis was reported. The writer agrees with Peters "that there is no organism which is so likely to take root and grow at the site of an injury as the tubercle bacillus." He calls attention to the early age at which tuberculous diseases of the eye are manifested and adds that in many cases it is not recognized or is passed on account of lack of discovery of bacilli. He estimates that of all the cases recorded in literature in which ophthalmic tuberculosis was the cause of death, not less than 50 per cent. died of either acute or chronic tuberculous meningitis. He believes that many lives could be saved by timely enucleation of the infected organ.

He believes "that of the 142 cases that gave no history, at least 75 per cent. were due to injury; and the balance of the cases recorded as primary tuberculosis without cause were also due to injury." He gives the histories of his own cases, one in the iris, two in the choroid, and one in the conjunctiva, the primary origin of each being injury, and in conclusion says: "First, I am reasonably satisfied from the cases that have been reported, and from my own observation, that at least 75 per cent. of all cases of tuberculosis of the eye are due to two primary causes, either to infection from other parts of the body, or from direct injury to the eye; and second, that in primary tuberculosis of the eye early diagnosis and operation robs death of many of its victims." A very extensive bibliography is appended.

The Various Causes of Obstruction in the Central Artery of the Retina.

Thompson, A. Hugh, London, Eng. (*Ophthalmic Review*, March, 1902.) The writer points out the conflicting nature of authoritative utterances on this subject and reviews the various explanations of the phenomena which have been put forward.

1. *Embolism.* "In many cases," he says, "the suddenness of the loss of sight, and the total absence of any previous warnings or prodromal symptoms, suggest this

explanation very strongly, even in the absence of any demonstrable heart lesion. The following objections to the theory, however, have been put forward: (1) Soon after the onset of blindness there is a certain amount of blood circulating through the retinal vessels, whereas a total embolism would cause a total stoppage (Reimar)." The only means by which circulation can be re-established after embolism of the central artery must be the establishment of a collateral circulation. The only possible channel for anastomosis is the network of capillaries which surrounds the optic disc, and he believes that this channel is, in some cases at any rate, sufficient to re-establish the circulation to the small extent which is actually found. The writer quotes Nettleship and Manz and gives their arguments in favor of this explanation. (2) A second objection to the theory of embolism is the lack of ophthalmoscopic evidence in its favor (Reimar). (3) A similar objection raised by Reimar and also by Haab, is that not one of the sixteen published cases, in which the pathological examinations of eyes showing this condition is described, is quite convincing. The shortest interval between obstruction and excision was six weeks, and here the appearances described point rather to a thickening of the intima than to an embolus. He admits that the distinction between an old embolus, an old thrombosis, and a proliferation of the vessel wall, is not an easy one; but this does not warrant the assertion that in no case has pathological proof of an embolus been forthcoming (Nettleship).

2. *Hemorrhage into the Optic Nerve Sheath.* In default of any pathological evidence in support of this theory we can only regard it as a possibility, though one which must not be left out of account in cases where no other plausible explanation can be suggested, and especially where epistaxis or other forms of hemorrhage is present.

3. *Primary Thrombosis.* Priestley Smith based the diagnosis in his eight cases, reported in 1884, on the following points: (a) Previous attacks of transient blindness in the blind eye; (b) a simultaneous attack of transient blindness in the fellow eye; (c) previous or subsequent attacks of transient blindness in the fellow eye, especially if the conditions of onset were the same in the permanent as in the transient attacks; (d) signs of dis-

turbance of the cerebral circulation at the onset of the blindness—giddiness, faintness, headache. Thompson points out that so long as the endothelium of an artery remains intact, healthy blood, even though it be stagnant, does not clot in it; it is only when the intima becomes disintegrated that this happens (Cohnheim). He adds: "Many of these cases in which the block occurs either in the vein or the artery, are more probably due to disease of the vessel walls, and some, at any rate, of the cases of arterial obstruction are certainly due to spasm."

4. *Spasm of the Muscular Walls of the Artery.* The validity of this explanation depends on the following: (1) The extreme sensitiveness of the inner layers of the retina to a continuous supply of arterial blood, so that if this is cut off even for a short time, the functions of the retina are permanently destroyed; (2) clinical evidence of spasm occurring in the retinal arteries. The writer claims that evidence of the occurrence of spasm is both direct and indirect; attacks of temporary blindness occurring as a reflex manifestation could hardly be explained otherwise. Wagenmann made an ophthalmoscopic examination of the eyes of a patient in one of these attacks of transient blindness; light perception and direct and consensual pupil reactions were abolished; the disc was pale; arteries appeared as shiny yellow streaks in which no blood column could be seen; no pulsation on pressure; about ten minutes after the beginning of the attack, a fine red line was seen to appear in the arteries and the veins became large; thereupon the patient had perception of light, and the pupil reacted a little; in a few minutes the circulation, and with it the vision, was completely restored; six months later another attack was followed by complete blindness, with the ophthalmoscopic picture of embolism. A similar case was reported by Benson. These instances are sufficient, the writer believes, to prove that there is such a thing as spasm of the central artery of the retina, and that it may sometimes persist sufficiently long to cause total blindness. The ophthalmoscopic picture is very much the same, whatever the cause of the cutting-off of the supply of arterial blood to the retina.

On Intracranial Thrombosis as the Cause of Double Optic Neuritis in Cases of Chlorosis.

HAWTHORN, C. O., London. (*British Medical Journal*, Feb. 8, 1902.) This paper is written in support of the suggestion that double optic neuritis occurring in patients suffering from chlorosis is due to intracranial thrombosis. The evidence submitted, so far as the writer's personal experience goes, is based on a single case; but nevertheless he believes this to be highly significant if not conclusive, especially when added to testimony from other sources. His case was unusual in the simultaneous occurrence of sudden paralysis of the right rectus externus and of double optic neuritis; later there were macular changes; these symptoms disappeared after treatment lasting a few weeks. Hawthorn assumes that the paralysis and neuritis arose from a common cause since they appeared at about the same time, and declined together, and believes intracranial thrombosis to be a competent and probable cause. He quotes W. H. Welsh, who says: "Chlorosis must be given a leading place among the causes of spontaneous thrombosis of the cerebral veins and sinuses in women." The writer believes that his theory is strengthened by the fact that optic neuritis sometimes occurs with suppurative disease of the middle ear not due to abscess, since many such patients recover completely without surgical intervention, though he admits that meningitis cannot be excluded in such cases; furthermore that a number of cases of ear disease with optic neuritis are on record, in which the removal of a clot from the lateral sinus has been followed by disappearance of all the symptoms.

Hawthorn speaks of the cases in which optic neuritis develops after considerable hemorrhage, and suggests that the change in the quality of the blood and the weakening effect on the heart produced by the hemorrhage may possibly lead to thrombosis in the cerebral veins and sinuses, where, for anatomical reasons, the blood current is naturally sluggish. In such cases the bulk of the blood is soon restored, while the restoration of the corpuscles is a much slower process, producing conditions not unlike those in chlorosis. He believes the mechanism of neuritis due to thrombosis to be the same as that due to cerebral tumor.

Concerning treatment the writer draws attention to the

two immediate risks (1) that the thrombosis will extend, and (2) that a portion will become detached and lead to embolism. To prevent the latter result, he considers complete rest to be imperative; but on the other hand, it is necessary to prevent the policy of rest from reducing the vigor of the circulation. He would therefore supplement the administration of iron, by cardiac tonics and diffusible stimulants, especially ammonia. "When a passive thrombus has been fully formed, its tendency is not to detachment but to organization, and thus, as soon as the above measures have afforded a reasonable guarantee that further extension of the thrombus is improbable, complete rest should no longer be enforced. The indication now is to increase the vigor of those vital processes on which organization and practical removal of the thrombus depends. Among these is a reasonable amount of exercise, which, the fear of embolism having been reduced to a minimum, may now be safely and beneficially ordered and pursued."

The Requirements of a Test for Color-Blindness.

EDRIDGE, GREEN, F. W. (*The Ophthalmic Review*, Feb., 1902.) The writer says that: "the first requirement of a test for color-blindness is that color names be used, and that the person to be examined should employ and understand the use of the color names, red, yellow, green and blue." The color-blind can be placed in the following groups: (1) Those who, whilst having a spectrum of the normal length, have a diminished number of units; that is to say, who see five, four, three, two or one color instead of the normal six; (2) those who, with or without the nornal number of units, have a spectrum shortened at one or both ends.

"We wish," he says, "to exclude from the marine and railway services all those individuals who belong to the following three classes: (1) Those who possess a psychophysical color perception with three units or fewer than three; (2) those who, whilst being able to perceive a greater number of units than three, have the red end of the spectrum shortened to a degree incompatible with recognition of a red light at a moderate distance; (3) those who are affected with central scotoma for red or green." Explaining these classes the writer says the three unit confuse yellow with red and green; they regard yellow as

red-green, and blue as violet-green. The two unit regard green and red as almost identical. "It is very important," he says, "that persons belonging to the second class should be excluded, and yet none of the ordinarily used tests detect them. In the third class the condition is one in which a person might be able to distinguish colors easily when they are close to him, but failed to distinguish them at a distance, owing to the nerve fibres supplying the central portion of his retina being impaired."

Speaking of the actual test to be employed, Edridge-Green recommends the use of the lantern, varying the intensity and character of the light by certain kinds of neutral glass, without the knowledge of the candidate. The glasses he uses, "like a mist or fog, are most transparent to the red rays at the extreme left of the spectrum, and where several such glasses are used together the light allowed to pass through them has a distinctly reddish hue. The normal-sighted easily recognize colored lights which have had their intensity diminished by neutral glass, but the color-blind find great difficulty in distinguishing the colors under these circumstances." The neutral glass is to be placed in front of the colored glass, not between it and the light, and the examinee should be at least 15 feet from the lantern. The examination should on no account be conducted on any regular plan, lest the candidate find out the order from some person previously examined. If the candidate calls the standard red "green," or the standard green "red," either alone or in combination with the modifying glasses, he is to be rejected. Particular attention should be paid to the answers given to the combination of the thickest neutral glass with the standard red and green respectively. With this glass the relative intensity and character of the red and green lights is changed, exactly as it is in a mist or fog.

The writer refers briefly to his "classification list," a box containing 150 words, 10 skeins of silk, 10 pieces of colored cardboard, and 10 pieces of colored glass. This test cannot be substituted for the lantern test, but may be found of value when an examiner is in doubt whether to reject a candidate.

The Visual Purple of the Retina.

EDRIDGE-GREEN, F. W., London. *(British Med.*

Journal, Feb. 8, 1902.) The writer undertook the investigation in order to ascertain whether he could obtain any objective evidence of the diffusion of the visual purple into the yellow spot. Many phenomena pointed to this conclusion, such as the fact that a perceptible interval elapsed before people were able to see with the yellow spot, and that a light might fall on the fovea without producing any sensation. On examining the retina of a monkey, it was at once evident that the visual purple extended to the yellow spot, but the very deep yellow of the spot prevented him from saying with certainty that the color altered on exposure to light. He had unsuccessfully tried to find a substance which would fix the visual purple. He tried to obtain an early view of the yellow spot through a microscope; it was at first red and gradually bleached under the light. On examining the region just external to the yellow spot, he saw rose-colored cones surrounded by one or more circles of colorless rods. He kept two monkeys in a dark room for 24 hours and then excised their eyes under chloroform, the room being illuminated only by a ruby light. Viewed under the microscope, with white light, the whole retina was bright crimson, but the brightest part of all was the yellow spot; the visual purple was situated between and not in the cones, in the rod-free district of the yellow spot.

Central Amblyopia in Ocular Affections with Glycosuria.

Pyle, Walter L., M. D. (*Amer. Med.*, April 19, 1902.) The paper is summarized by Dr. Pyle as follows:

"1. Diabetes mellitus or other disturbance of the carbohydrate metabolism may affect any portion of the visual apparatus.

2. The ocular changes may be produced by chemic or physical means, or indirectly through the associate general debility.

3. The ocular affections may vary in intensity from a slight failure of accommodation to a formidable hemorrhagic retinitis and total optic nerve atrophy. Minor visual disturbances are often made worse by fatigue or increased cardiac action, and may improve after prolonged rest or decrease of vascular tension.

4. The intraocular disturbances may be exclusively unilateral, and there is never seen ophthalmoscopically,

inflammation of the optic nerve—important differences from the changes in albuminuria, syphilis and other blood-dyscrasias.

5. It is not uncommon to find albuminuria coexistent with glycosuria, and the retinal changes may present a mixed picture, or a typical albuminuria retinitis may be present in a patient with diabetes.

6. Central amblyopia may exist in glycosuria entirely independent of the toxic influence of alcohol and tobacco, or in patients addicted to the habitual use of these substances, this may be the prominent factor in causation. In these cases the initial lesion may be in the ganglion cells of the retina; the inflammation of the "papillomacular fibers" of the temporal half of the optic nerve being secondary to the retinal changes.

7. In chronic cases of glycosuria, with the exception of cataract, the ocular symptoms are often present when the constitutional and urinary symptoms are not marked.

8. The ocular symptoms may be the first to lead the patient to seek medical advice. Therefore glycosuria should be suspected in the following conditions:

(a) Premature presbyopia.

(b) Unexplained mydriasis or cycloplegia.

(c) Sudden change in the refraction; particularly, marked development or increase of myopia past middle age, without cataractous changes.

(d) Intractable iritis.

(e) Cataract in young or middle-aged persons. An examination of the urine is advisable even in cases of senile cataract, as the etiology has a bearing on the prognosis of operation.

(f) Retinitis, particularly of the hemorrhagic variety.

(g) Unexplained optic nerve atrophy.

(h) Sudden and marked amblyopia, particularly central, without visible fundus changes.

9. The prognostic significance of the ocular disturbances is not definitely established, on account of the great difference in pathogenesis, severity, and ultimate issue of the numerous forms of glycosuria. Even in well-marked cases not only many formidable eye-lesions improve, but the patient's general health may be restored. Again the

ocular symptoms may remain stationary and the general health improve, or a case of diabetes mellitus may proceed rapidly to a fatal termination without showing marked ocular disturbances. Hemorrhagic retinitis and amaurosis preliminary to coma are the most serious symptoms. The ophthalmoscopic observation of greatest value in prognosis is the state of the retinal vessels, as this may be taken as an index of the patient's general vascular condition."

Phlegmone der Orbita in ihrer Beziehung zu der Frage der Sympathischen Ophthalmie.

HALE, ALBERT B. (*New Yorker Medicinische Monatsschrift*, February, 1902.) From the three cases which Hale reports he concludes that the theory of transmigration of bacteria in the production of sympathetic ophthalmia will not account for all the facts, especially where there is a long interval between the infection of the second eye and the injury to the other. The case of Schmidt-Rimpler, published in the Deutsche Medicin-Wochenschr. No. 27, 1900, in which an echinococcus of one eye was accompanied by sympathetic ophthalmia of the other is still more difficult to explain by this theory. He is, therefore, brought to the conclusion from his own cases and these others that sympathetic ophthalmia is a neuritis which is not produced entirely by the migration of micro-organisms, but that in any case where it has to do with the growth of bacteria it can be only by the irritation of tissues by the toxins thus produced.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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(Quarter Ending March 31, 1902.)

Two Cases of Fracture of the Orbital Vault: Cure.

GUIBERT, Roche-sur-Yon. (*La Clinique Ophtalmologique*, 10th March, 1902.) Guibert states that of fifty-two cases of fracture of the orbital vault collected by Berlin, forty were fatal.

He reports the following instructive cases, both of which recovered:

I. A twenty-year-old male was struck in the face by the horn of a deer. The patient was rendered unconscious, followed by profuse hemorrhage.

Examination twenty-four hours later showed the case to be in a comatous condition with an absence of movement on the right side. The left orbit was almost exenterated, the eye hanging out upon the cheek. From the cerebral disturbance, fracture of the orbital vault was suspected.

During the removal of the eyeball and lacerated orbital tissue, a tablespoonful of cerebral substance escaped. Surgical intervention was stopped and an iodoform tampon was inserted into the cavity.

Intelligence soon returned, motion appeared in the right limbs, and there was some aphasia. Aside from some suppuration in the orbit, convalescence was uneventful and recovery, except for a permanent deformity of the lids, was complete.

II. A twenty-nine-year-old female received a charge of bird shot in the face, carrying away the right eye and its lids, and destroying the left eye. The nose was only slightly injured. Except for blindness and deformity following the injury, recovery was complete.

The author advocates less frequent interference in such cases.

Study of Dionine: Its Use in Ocular Therapeutics.

DARIER, Paris. (*La Clinique Ophtalmologique*, 10th January, 1902.) Darier has employed dionine in various forms of keratitis, iritis, and in glaucoma. He believes that in this drug we have the most important recent additions to our therapeutic agents. It is a derivative of morphin and acts both centrally and locally. Introduced into the subconjunctival tissues, it acts as a marked sedative through the periocular lymph spaces, this effect not being produced by its absorption elsewhere.

Locally, upon the conjunctiva, it serves as an analgesic, an antiseptic, and a lymphagogue with very feeble local anesthetic powers. To its derivative action as a lymphagogue may be attributed the permanency of its powers upon inflammatory states and its efficiency in hastening the absorption of the postoperative débris of cataract.

The author concludes that the drug should be employed to quiet pain in all cases in which local anesthetics are futile; to hasten absorption of pupillary exudates; and to favor mydriasis. By preference, he has employed it in solutions of two per cent. strengths, from which no toxic effects have been reported.

Congenital Functional Anomaly of the Lacrimal Gland of the Right Side.

ANTONELLI, Paris. (*La Clinique Ophtalmologique*, 10th February, 1902.) Antonelli gives the history of a child of ten years of age in whom during mastication there was a profuse lacrimal secretion on the right side. The only visible anatomical anomaly that could be found was a slight turgescence of the veins around the external canthus. Chemically, the lacrimal fluid was normal. When the patient was weeping from emotion the response was equal on the two sides. The condition seemed to be the reversal of a fact that has been noted by Michel, and later confirmed by Aschunbrandt, who by irritation of the con-

junctiva produced hypersecretion of all the salivary glands; a reflex that they say was established through the lacrimal nerve, the ophthalmic branch of the fifth, the Gasserian ganglion, the third branch of the fifth, the otic ganglion, the lingual nerve and the chorda tympani, the superficial lesser petrosal nerve, the anastomosis of Jacobson, and the petrosal ganglion.

Cuprol, a New Medicament for the Treatment of Conjunctivitis.

SICHERER, Munich. (*La Clinique Ophtalmologique*, 25th January, 1902.) Cuprol, Sicherer says, is a combination of copper and nucleinic acid, containing six per cent. of copper. It is easily soluble in water, especially when warm. Both albuminous and alkaline solutions remain clear. The solution of preference is one of ten per cent. strength, to which may be added a half per cent. strength of chloretone as a preservative.

The principal advantage of applications of this drug is their comparative freedom from pain—merely a slight burning sensation appearing about ten to twenty minutes after instillation. The author has employed the solution with success in the ordinary forms of conjunctivitis, and quotes the favorable results obtained from it by Snell in the treatment of trachoma.

Pathogenesis of Glaucoma.

URIBE-TRONCOSO, Mexico. (*Annales d'Oculistique*, December, 1901.) Uribe-Troncoso, from clinical and experimental researches, is convinced that alterations in the quality of the intraocular fluids is the important factor in the production of the hypertension of glaucoma. The obliteration of the filtration angle, he says, is not always present in acute inflammatory glaucoma and is to be regarded as a result rather than a cause of increased intraocular tension. He, in conjunction with skilled chemists, has studied the aqueous humor in nineteen cases of glaucoma, and has found the density raised between 1.005.50 and 1.022 in contrast with a normal density of 1.005 to 1.012 as reported by different authors: the mineral matter likewise averaged higher than normal; while the organic matter varied between 0.78 and 3.85 as compared with a maximum of 0.68 found in the normal fluid. In one case of serous iritis the proportion was slightly greater than

the maximum that was found in glaucoma; while in other diseases the glaucoma ratios were constantly higher. The data given are not fixed, and indicate merely the degree of the vascular lesion and the state of the affection.

Hypertension, he says, may result from difficulty in excreting a highly albuminous fluid or may arise mechanically from obliteration of the filtration angle. The albuminous material may come, he believes, from an inflammation of the anterior segment of the eyeball or from some vascular disease as is the case in glaucoma.

Normally, he believes the vessels of the ciliary body and the iris do not permit the transudation of albumen, but when these tissues are diseased, a disalbuminosis similar to that occurring in interstitial nephritis results. The vascular changes consist of hyalin degeneration, with dilatation and obliteration of the blood channels of the uveal tract and retina. He calls attention to the fact that Kuhnt and Haab describe an endarteritis affecting principally the vessels of the ciliary circle. These vascular changes, he thinks, easily explain the increased albuminous deposit in the aqueous humor; the initial phenomenon and active cause of hypertension in glaucoma. In the condition, however, in addition to these changes, there are alterations in the vitreous humor which are absent in serous iritis that but rarely terminates in glaucoma.

The author has detected a network of intracellular canals in the normal vitreous humor. In glaucoma these spaces, he has found, are closed by condensation of the hyalin substance, with a resultant augmentation of the volume of the vitreous. This increase, by pushing forward the ciliary body of the iris, and thus closing the filtration angle, aggravates and prolongs the increased tension that has been primarily due to the difficulty of exosmosis of the hyperalbuminous aqueous fluid.

After several such attacks, he says, the vitreous humor no longer returns to its normal state, and the excretion angle is permanently occluded by adhesions between the base of the iris and the cornea, and thus absolute glaucoma becomes the result.

In hemorrhagic glaucoma, both the hemorrhages and the glaucomatic condition are the simultaneous results of profound vascular changes, this form of glaucoma rapidly

becoming absolute from the severity and the suddenness of the increase in the volume of the vitreous humor with the impossibility of elimination.

From our knowledge of the pathological anatomy, he says, the action of the iridectomy is self explanatory. In advanced cases, the inefficiency of the operation is due to an impossibility of restoring an obliterated filtration angle.

Repeated paracentesis, he believes, may be curative in incipient cases since it is known that ocular disalbuminosis is transitory in such stages. He does not recommend sclerotomy, while posterior sclerotomy, he thinks, may be of much value, especially for the relief of pain in absolute glaucoma.

Resection of the superior cervical ganglion is, he believes, only of transitory value. Eserin, he says, relieves principally by contracting the vessels of the eyeball, thus diminishing the amount of the albumin that is excreted, and thereby aiding filtration.

Simple glaucoma, he asserts, rarely terminates in blindness without the appearance of the signs of hypertension. The formation of the excavation of the optic nerve head, he has found, results from two factors: inflammation and degeneration from lesions of the ophthalmic artery and hypertension. The first of these is very similar, he says, to those vascular changes which may result in simple optic atrophy, thus explaining the similarity which is at times noted between the two conditions.

He believes that glaucomatous neuritis alone does not explain the genesis of simple glaucoma, but to this, he thinks, must be added those nutritive changes in the vitreous humor which result from vascular sclerosis, viz., edema and increase in the albuminous elements from which result swelling of the vitreous humor, advancement of the iris base, and consequent difficulty in excretion; these changes being analagous to those that occur in inflammatory glaucoma, into which the simple form is not infrequently transformed.

The various causes of secondary glaucoma are enumerated and the hypertension in all is ascribed to the presence of one or both of the following factors: difficulty of excretion due to the presence of abnormal elements, and occlusion of the filtration angle.

He has experimentally produced glaucoma in rabbits by the injection of albuminous fluids into the anterior chamber. He has found that two classes of phenomena are thus produced: those of hypertension, and those of reaction. The former were apparently due to the difficulty of excretion and not to hypersecretion of the aqueous humor, since the anterior chamber was diminished in depth and its angle remained free.

The reaction symptoms that he found in those cases were, he believes, principally dependent upon the action of the foreign body that was introduced into the eyeball.

The Treatment of Ptosis by the Method of Motais.

LAURENT, Rennes. (*Annales d'Oculistique*, December, 1901.) Laurent describes a marked case of bilateral congenital ptosis in which the Motais method of operation was performed in each upper eyelid with marked benefit.

During the operative procedure upon the second eye, instead of employing pointed hooks to expose the conjunctival sac, wire threads passed through the free border of the lid and through the indicated scleral point, were used as tractors, thus obtaining a better exposure of the cul-de-sac. After this operation, a corneal ulcer developed, this being partly due to the patient refusing proper after-treatment, although the primitive factor was the presence of the tarsal suture acting as a foreign body.

This complication, Laurent says, is not infrequent, and is to be avoided by bringing the suture through the lid nearer the ciliary border and by constant cleanliness for a few days after operation. He states that postoperative strabismus has been noted, and believes that it may result either from an excess of tissue included in the suture or from a failure of union of the flap and the tarsus; the latter complication being largely avoided by the employment of wire sutures, and taking care to place them at the musculo-tendinous junction of the superior rectus muscle flap.

The Motais method of operation, he believes, is superior to all others in that it restores both physiological movements and normal appearances.

On Two Cases of Paralysis of the Superior Oblique Muscle After the Radical Cure of Disease of the Frontal Sinus.

STANCULEANU, Paris. (*Archives d'Ophtalmologie*, Jan-

uary, 1902.) Stanculeanu reports two cases of paralysis of the superior oblique muscle consecutive to the Kuhnt method of operation for frontal sinus disease.

The first case was that of a male aged nineteen years. Two weeks after an attack of la grippe, the patient developed a purulent discharge from the left nostril with pain in the left eye and left side of the head.

Upon admission to the hospital, there was found to be a swelling of the upper eyelid, and the inner angle of the lids was partly obliterated.

The Ogston-Luc operation failing, the Kuhnt method was performed and was followed by a rapid cure; but the patient complained of seeing double at the time of the first dressing. Investigation revealed a typical paralysis of the left superior oblique muscle. Landolt, in whose clinic the patient had entered, did an advancement of the left inferior rectus muscle obtaining an excellent result; diplopia being noted only in the right field.

Tha second case was that of a twenty-six year old man who had been suffering from disease of four years standing. The Kuhnt operation was performed, and was followed by paralysis of the left superior oblique muscle. An advancement of the left inferior rectus muscle performed by Landolt, was followed by complete restoration of binocular vision.

Stanculeanu believes that the paralysis occuring so soon after the operation must have been the result of operative injury, and not the consequence of postoperative inflammation, etc. He says that it probably takes place during the resection of the lower anterior wall of the frontal sinus and not at the time of the scraping of the nasofrontal sinus; since the latter procedure is made at some distance from the fovea trochlearis. He reminds us that Sieur and Jacob from anatomical researches, have found the frontal sinus limited to the superior inner angle of the orbit in one third of the cases that they have studied, and state that since the trepanning for the frontal sinus would result in an exposure of the brain in such a case, they have advised approaching the sinus by the orbital route:—a method that is still more likely to produce injury to the superior oblique muscle. Landolt's plan of advancing the inferior rectus muscle of the same eye, he asserts, is to be pre-

ferred to a tenotomy of the corresponding muscle of the fellow eye.

Treatment of Xanthoma by Electrolysis.

LEPLAT, Liège. (*La Clinique Ophtalmologique*, 25th January, 1902.) Leplat has employed electrolysis for the treatment of xanthoma of the lower lid which was one by two centimeters in size. A two to four milliampere strength current was employed at five sittings, in each of which five or six punctures were made. The platinum needle was attached to the cathode: It was passed very obliquely into the skin. The tumor disappeared, and was replaced by a series of linear cicatrices.

The author has employed electrolysis in other similar cases with benefit, and believes that the method is indicated for the large, nodular, and incipient forms of the disease.

Treatment of Keratitis by Electrolysis.

GALLEMAERTS, Brussels. (*La Clinique Ophtalmologique*, 10th January, 1902.) Gallemaerts has employed electrolysis repeatedly in the treatment of strumous pannus and in ulcerative keratitis. The procedure has been usually fraught with great benefit, and has never been followed by ill effects. He uses a two milliampere strength current, the positive electrode being placed on the temple or malar bone. For the negative electrode, he employs either a de Wecker holder or a simple platinum needle. In cases of total pannus, he has found that general narcosis is advisable during the procedure. In other cases, local anesthesia is sufficient.

How One Should Extract a Cataract a Century and One-Half After Daviel.

DE WECKER, Paris. (*Annales d'Oculistique*, November, 1901.) De Wecker prophecies a stationary position for the technique of cataract extraction during the first part and perhaps during all of the twentieth century.

Daviel, he says, employed a pair of curved scissors for making the corneal section, a method that was difficult, but one that allowed the formation of a regular flap and an easily gaping wound. Daviel objected to the use of a knife to make the section, because he believed it required the operator to be ambidextrous: this, in spite of the fact of the ease with which a knife section could be made.

Tenon, de Wecker says, was the first to recognize the advantage of the narrow knife which was employed by Graefe much later and became generalized in use. Graefe, he states, believed a cutting wire to be the ideal knife, but the flexibility of such an instrument he said, would prevent its use. The narrow knife of Graefe produced an incision similar to that of Daviel with the advantage, of a widely gaping wound, through which lenticular debris could be more easily removed. The broader knife recently proposed by Terrien is regarded by the author as a retrograde step.

The employment of a capsule forceps to remove a portion of the capsule before expression of the lens is advocated in order to lessen the liability of secondary cataract; but the delicacy of manipulation, and the necessary construction of the instrument, are urged against the method.

Terrien's objection that subluxation of the lens and loss of vitreous humor may occur, is not in the opinion of the author justified. He likewise believes that the use of a dull curette in order to remove cortical matter is not to be recommended, as the danger of infection is increased, and the same end can be obtained by massage through the lower lid. He omits all details as to the combined operation, which he believes will be abandoned in the future: thanks he says, to the employment of stronger miotics.

The section, he states, has been variously placed, but principally, laterally, inferiorly, and superiorly. The first method had few exponents: the second, due to the influence of Beer gave place to the third, because the effects of suppuration and iris prolapse left the lower and more valuable part of the cornea clear.

Of the various means of judging the size of the flap, the author believes that this can be best guaged by beginning one millimeter above the horizontal meridian of the cornea. Of more importance, however, he asserts, is the location of the circumference of the incision. Beer, he states, placed it in the cornea, one millimeter from the sclera, while Jacobson put it entirely in the sclera. Graefe, to obtain a maximum of linearity and coaptation of the wound placed the extremities of his incision in the opaque pericorneal tissue. De Wecker believes that the placing of the incision exactly at the border of the transparent cor-

nea has won the day, and that sympathetic ophthalmitis is much less frequent with such a form of incision than when the section is made within the sclera. Moreover, he says, the summit of the flap should also be placed at the limbus, and not two or three millimeters in front of it, since in the latter plan, the removal of cortical matter is rendered more difficult, and hernia of the iris is liable to occur.

The increasing skill of the operator, he believes, will increasingly free him from the employment of a speculum and fixation forceps, but, with a restless patient, their use is to be sanctioned. If a speculum is employed it should be removed as soon as the section is made in the simple form of extraction, and when the iridectomy is done in the combined method of procedure.

(To be continued.)

A Case of Ophthalmia from a Caterpillar.

Bewerен, Stocke, Vaès. (*La Clinique Ophtalmologique*, Dec. 25, 1901.) Stocke reports a case of violent conjunctivitis with iridocyclitis, the result of contact with the eye of a crushed caterpillar.

The symptoms developed in a few hours' time. When the case was seen by the author three days later, there were swelling and redness of the lids. The conjunctiva was moderately chemosed. A pea-sized vesicle at the lower inner border of the cornea could be seen. There was no conjunctival discharge. The iris was greenish in tint and sluggish in its reaction. The pupil was contracted. There was ciliary tenderness. Subjectively, there were marked pain and photophobia.

Under appropriate treatment, the condition disappeared in fifteen days' time.

The Use of Iodipin in Ocular Therapeutics.

Von Hymmen, Stuttgart. (*La Clinique Ophtalmologique*, Jan. 10, 1902.) Von Hymmen remarks on the discomforts which often accompany the employment of large doses of potassium iodid, and hence recommends iodipin, a combination of the oil of sesame and iodine. The drug is well borne, even for long periods of time. Its elimination is very slow, traces of it remaining in the urine fifty-three days after administration.

It may be given by mouth in ten per cent. strength, six teaspoonfuls a day, or as the oil inclosed in capsules. It

may be also employed hypodermatically in ten to fifteen cg. doses of twenty-five per cent. strength solution every two or three days. It can be also administered by inunction.

Iodipin he says, can be given for all the conditions for which iodid of potassium has been used. He also states that it repeatedly succeeded in cases in which the latter drug had failed, not only in syphilitic affections but also in cases of tumors and chronic inflammatory exudates, ocular palsies, etc.

Acute Monolateral Retrobular Neuritis due to Menstrual Disturbance at the Menopause.

STOCKE, BEWEREN, Vaès. (*La Clinique Ophtalmologique*, Feb. 10, 1902.) Stocke enumerates the ordinary causes of retrobulbar neuritis, and remarks on the possibility of complete cure of the condition if the macular fibres are not destroyed.

The author has observed a case in which the cause was menstrual in character, an etiological factor that has been rarely considered.

The case, an hysterical, well nourished single woman of forty-five years of age, had arrived at the age of menopause; the flow appearing irregularly at long intervals of time.

On the sixth of the month, cephalalgia and rachialgia developed, followed in three days' time, by a profuse menstrual flow. The day following, the patient felt as if a cord or a curtain were being drawn over the right eye. Eight days later, she noticed on arising that the right eye was blind. External examination of the organ at this time revealed only a dilated pupil. The ophthalmoscope showed a slight irregularity of the retinal vessels. Vision was reduced to light perception. Ocular motion and pressure on the globe produced pain in the base of the orbit. Local bleeding and iodide of potassium were prescribed, and later, mercurial inunctions about the orbit, were employed. Nine days after this, it is noted that the orbital pain and cephalalgia continued. At this time, there was a relative central scotoma, though vision had increased to one-eighth of normal. The margins of the optic disc were indistinct, and the arteries on the nerve head were slightly veiled and contracted.

In about a month's time, vision returned to normal. The temporal segment of the nerve-head was atrophic, showing the lamina cribrosa. The retinal arteries were slightly contracted, and the corresponding veins were dilated. The fundus of the eye had assumed a dirty color.

Epibulbar Tumors of the Sclerocorneal Limbus.

PANAS, Paris. (*Archives d' Ophtalmologie*, January, 1902.) Panas limits his paper to the consideration of malignant tumors of the sclerocorneal junction.

The first case was seen in a sixty-one year old female. When the patient was nineteen years old, a grain of carbon became imbedded in the conjunctiva at the site of the tumor. At twenty-five years of age, she noticed a pin-head sized reddish mass, which, when she became thirty-three years of age, had assumed the size of a small pea. Excision was twice practiced, but the mass returned. When she was first studied by the author, the growth had increased to the size of a filbert. It was dark in color, lobulated, and was situated at the inner margin of the cornea, over which it encroached about two millimeters. Posteriorly, it extended to the semilunar fold. The iris and the other ocular contents as far as could be seen, appeared normal. Operation showed that the tumor was attached only to the limbus of the cornea, and that there was not any perforation of the coats of the eyeball.

The second case was that of a forty-six year old man who presented himself with a chestnut-colored tumor three millimeters in diameter and two millimeters high situated at the lower outer limbus of the cornea. The growth had first appeared some three years before, and had been twice removed, only to quickly return. Excision was performed, followed by deep cauterization of the base. One year later, there had not been any return of the growth. Histologic study of the mass revealed that it, like that in the first case, was a true epitheliosarcoma.

The third case was found in a seventy-one year old woman. Eight years before she had been seen by the author, she had noticed a pigmented spot on the outer surface of the globe. During the last year, this spot had rapidly enlarged in size, and on admission to the hospital,

it was found to consist of a dark brown mass that was eleven millimeters in width situated at the upper outer limbus of the cornea. Removal was practiced as in the second case: This was followed a month later, by the appearance of a small nodule. Excision of the recurrent mass was not attended with any further relapse. Microscopically, the structures of the growth were found to be epitheliosarcomatous in character.

The majority of tumors of the bulbar conjunctiva, the author says, have their sites at the limbus of the cornea. They may be of various colors, sizes, and shapes. Their progress is either very slow or stationary until the patient reaches the age of forty years or more. Perforation of the ocular coats is quite rare, and is found only during the latest stages of the disease. Involvement of the subjacent cornea and sclera is always limited.

From an analysis of sixty-seven reported cases, the site of the tumor was found to be situated at the temporal limbus in forty-one; the nasal limbus in seventeen, the lower limbus in one, and the upper limbus in two; the positions not being given in the remaining seven.

The structure of this class of tumors, he says, has been the subject of much debate. Of one hundred and eight cases that have been reported, eighty-one have been held to be epitheliomatous, and the remaining twenty-seven sarcomatous. The epibulbar types of tumors of the limbus of the cornea are distinguished from sarcomata of the chorioid and also from tumors of the other parts of the bulbar or palpebral conjunctiva, he says, by their slow progress and the absence of involvement of the deeper structures. He, therefore, advises excision and cauterization of the base of growth by the thermocautery in cases in which there is not any evident perforation of the globe or adjacent glandular involvement. In the latter condition, a radical operation must be performed.

Comparative Value of Radiography for the Determination of Foreign Bodies in the Orbit.

Terrien and Beclere, Paris. (*La Clinique Ophtalmologique*, Jan. 10, 1902.) Terrien and Béclere dispute the statement of Bourgeois that radioscopy is of little value in ophthalmology, and report a case in which perforation of the upper lid by a bird shot resulted in intraocular

hemorrhage, and in which radioscopy distinctly revealed the presence of a foreign body in the orbit. This conclusion was based upon the fact that during various motions of the globe the foreign mass remained fixed; a condition that could only have possibly existed intraocularly if the foreign body had been located centrally in the globe; and this the ophthalmoscope disproved.

The Unit of Measure of Visual Acuity.

SULZER, Geneva. (*Annales d'Oculistique*, December, 1901.) Sulzer claims that it is generally admitted that the unit of visual acuity (angle of one degree) presented by Giraud-Teulon and Snellen, in 1862, is too large. They also object to employing the maximum angle as a unit and to expressing lowered vision in fractional terms, a method, they say, that is at variance with other metrological processes. To be in accord with scientific plans, they believe the lowest visual acuity of vision should be chosen as a unit, and any increase of visual power expressed in multiples of this unit.

Visual acuity, they state, can be determined only by the power of distinguishing points that are separated by a minimum distance. Acute or central vision, as they term it, is practically limited to a circular or oval area of about one and a half millimeters in diameter, situated about the macula, and they believe that test-objects of corresponding size should be chosen as units.

In other scientific departments, the grade or one-hundredth part of a quarter of a circle is being adopted as a unit, and this the authors propose as the unit of visual tests. The grade is equal to fifty-four minutes, and is therefore about ten times larger than the present visual unit of five minutes for distance. Visual acuity of less than this could be expressed in terms of decimals, and when better, in multiples. Comparative tables are given to explain the relative case with which the new nomenclature could follow and supplant the old system.

Investigating on Quinine Amaurosis.

DRUAULT, Paris. (*Archives d'Ophtalmologie*, January, 1902.) Druault has analyzed the writings on quinine amaurosis, and refers particularly to the work of Ward Holden who has observed progressive degeneration of the ganglion cells of the retina after the third day of intoxi-

cation, and that of Nuél which confirms the findings of Holden, and who also noted chromatolysis of the same cells in a case of blindness lasting but one day. The pathogenesis of the condition, however, he says, is still unsettled. Uthoff believes the changes in the retina and nerve to be the results of circulatory disturbance.

The author in his experiments employed quinine chlorhydrosulphate in a ten per cent. aqueous solution, of which he injected hypodermatically the equivalent to sixteen and a half to twenty centigrams of the alkaloid. Most of the animals were intoxicated by a single injection. They were killed by illuminating gas and the eyes were studied by the Nissl method.

The symptoms of intoxication were vomiting, unconsciousness, general paralysis, ataxia and convulsions, amaurosis or amblyopia, mydriasis and fundus-changes.

The amaurosis and mydriasis were simultaneous, beginning two or three hours after the injection, and attaining a maximum four hours later. The fundus-changes consisted of general anemias, and at times of a diffuse haze. The primary anemia developed the first day, and was quite variable in degree. As a rule, the vessels were reduced to one-third their regular diameters. The secondary anemia in a typical case was much more marked and seemed to be dependent upon the destruction of the retinal cells. The changes in the retina consisted of rapid destruction of the ganglion cells, the cell-body changes being more rapid than those of their nuclei. When the tissues were studied by the method of Nissl, there appeared first, a hypercoloration with a later hypocoloration, and a final disappearance of the cell. These changes were noted as early as the fifth hour after the injection. The ganglion cells, he says, were rarely all destroyed; those of the central regions usually persisting in part; a fact which explains the persistence of central vision in this condition in man. This isolated destruction of the ganglion cells argues, he believes, for a selective action of the poison rather than it having been produced by ocular anemia. The lesions were always similar on the two sides. The optic nerve changes consisted simply of Wallerian degeneration.

The author has employed neurotomy on one side and

has injected quinine at varying periods later. He found that the cells whose nutrition were so modified, failed to undergo the usual changes, although on both sides, the vasoconstriction was equally well pronounced; this fact he says, is incompatible with the vascular theory of quinin amaurosis. Various other ocular operations were performed but with negative results in every instance. The retina of the dog, he states, is not fully developed at birth and negative results were obtained until the animal reached the age of fifteen days. At the age of fifty days the changes were similiar to those that are produced in the adult dog. This observation also argues for the nervous theory of the amaurosis, though it is possible, Druault says, that the vascular development may be analagous to that of the nerve elements.

Positive results were also obtained with cats, but the author's experiments on birds, mice, monkeys, and guinea pigs, were all negative.

The author concludes that the multipolar cells of the retina, and especially those of the dog, present a particularly marked suceptibility to quinine intoxication; a selective action which is similiar to that of curare on the motor nerves.

A Contribution to the Study of the Treatment of Relapsing Sympathetic Ophthalmitis.

DARIER, PARIS. (*La Clinique Ophtalmologique*, 10th. February, 1902.) Darier states that sympathetic ophthalmitis is at present usually ascribed to an infectious process, but the absence of bacteria in the sympathizing eye has given rise to the theory that toxines are propagated by continuity.

He reminds us that Bellarminoff and Selenkowski have injected the toxine of staphylococcus aureus thirty-four times into the vitreous humor of rabbits and have obtained positive results in twelve instances. Similiar positive results were not obtained by injections elsewhere; showing that transmission is by continuity. The author reports a case in which sympathetic disease followed a Critchett operation for corneal staphyloma. The stump of the exciting eye was removed, the anterior chamber of the sympathizing eye was evacuated, and a retrobulbar injection of one-to-one-thousand strength of cyanide of mercury was

given. Mercurial inunctions were employed and the subconjunctival injections of cyanide of mercury were continued with the production of an almost complete cure. Relapses took place and were treated by the cyanide of mercury injections, one iridectomy and paracentesis, and finally by a resection of the nerve of the enucleated eye and injections into the base of the orbit. Rapid improvement followed, and has been maintained for three months.

Radioscopy and Radiography.

BOURGEOIS, Reims. (*La Clinique Ophtalmologique*, 10th. February, 1902.) Bourgeois replies to Terrien's observations on radioscopy, and maintains that it is of little practical value, and that in the vast majority of cases resort to radiography becomes necessary.

Alterations of the Retina in the Chronic Anemias Produced by Neoplasms.

PICK, Koenigsburg. (*La Clinique Ophtalmolologique*, 25th. January, 1902.) Pick has noted fundus-changes in thirty to forty per cent. of cases of gastric cancer. These changes, he states, include grayish white retinal plaques of various size and shapes situated near the optic disc; retinal hemorrhages; and slight edema of the optic nerve heads.

These conditions are rarely found in those forms of anemia that are due to gastric ulcer, hepatic cirrhosis, and tuberculosis; and are, he says, probably the results of a toxemia. Anatomically, the plaques consist of varicose sclerosis of the nerve fibres, degeneration of the retinal elements, and formations of globular masses of hyaline.

Lymphangiectatic Elephantiasis and Cavernous Angioma of the Eyelids.

KOENIGSHOFER, Stuttgart. (*La Clinique Ophtalmologique*, 10th. March, 1902). The case was seen in a seamstress whose family history was negative. When the patient was six weeks' old, it was noticed that the left side of her face began to develop more rapidly than the right. Since the age of three years and until four years before being seen by Königshöfer, the patient had yearly attacks of erysipelas affecting the left side of the face. At the age of seven years, she had her left eye injured by a stone. Following this, began the development of the tumor-growths, which are described as follows: The left side of the face was

thickened, especially the upper lip. The tongue was larger than normal, particularly its left half. The nasal passages were practically normal. There was a slight goitre. On the outer half of the upper lid a poorly limited, firm, pale pink tumor of the size of a hazel nut could be seen, while near the internal canthus there was situated a smaller and softer reddish-blue mass. On the lower lid there was a soft reddish-blue growth which was twice the size of the first one described. Ocular examination except for the presence of a moderate degree of ametropia, was negative. These growths were excised at intervals, relapses occurring twice. Complete relief was obtained after their second removal. Microscopic examination showed the masses to contain enlarged lymph spaces and vessels. The erysipelas and the condition of the lymphatics had, no doubt, acted in vicious circles, infection being rendered easy by reason of the weakened tissues, while the congestion of the inflammation tended to increase the lymph distension and stasis.

Treatment of Ptosis Following the Cure of Trachoma by Palpebral Massage.

BOUCHARD, G. (*La Clinique Ophtalmologique*, 25th February, 1902.) After a severe and obstinate exacerbation of an acute trachomatous condition, the case reported suffered from a moderate degree of ptosis, the result according to Bouchard, of the relaxed condition of the palpebral tissues and thickening of the tarsus. The latter result, the author says, is more frequent in cases in which repeated scarification has been practiced. Massage of the eyelids twice daily for a period of twenty days was employed with the result of a considerable degree of elevation of the lid.

Simultaneous Embolism of the Central Artery of Both Retinæ.

VAN DUYSE, Ghent. (*Archives d' Ophtalmologie*, February, 1902.) The patient seen by Van Duyse was a male of seventy-one years of age, who while leaning forwards in the morning noticed a black cloud before his left eye. While expressing his astonishment at the occurrence, complete blindness appeared before the right eye. Since then (a period of three weeks' time) he remained absolutely blind. There were not any prodromes of any kind. At the first examination eight days after the accident,

both eyes showed the typical pictures of embolism of the central retinal artery; this condition gradually regressing in the usual manner. The patient's personal history did not evidence syphilis, rheumatism, nephritis, diabetes; and in fact, any serious form of illness. The peripheral arteries were atheromatous. Examination of the heart showed a mitral and aortic insufficiency with slight hypertrophy. Paracenteses of the anterior chamber of each eye followed by massage, with the hope of dislocating the probable emboli were tried, but without any result.

As to diagnosis, the author believes that thrombosis was improbable, this belief being based upon the absence of previous transient blindness of all central disturbance. Acute retrobulbar neuritis was excluded because the condition was much more marked on one side, with partial visual recovery (the presence of a temporary central scotoma) in eight to fifteen days' time. Hemorrhage into the orbit, the vaginal sheath, or the optic nerve, were said to be very improbable from the absence of all causes of such affections.

Stindorf, Van Duyse states, has reported ninety-nine cases of retinal embolism seen in the clinic of Hirschberg; and of these, three were said to have been bilateraly affected, the second embolus following the first at intervals of months or years.

Of the cases considered as simultaneous bilateral embolism, the author cites six instances in which, however, the blindness was transient in one or both eyes. All of these cases were considered embolic by Fisher. Their origin, however, according to the author, is open to the objection that in embolism of one eye a reflex ischemia of its fellow may be present. The case that the author reports, he says, is markedly different from the others in the fact of the permanency of the visual loss.

Hemianopic Contraction of the Visual Field in Tabetics: Its Prognostic Value.

Jocos, Paris. (*La Clinique Ophtalmologique*, 10th March 1902.) Ordinarily the optic atrophy and visual loss of tabes, Jocos says, go hand in hand: Rarely, however, the encroachments on the visual field are irregular; and in three cases reported these were hemianpoic in type.

The first case was that of a forty-eight year old female

who with a negative medical history, except for shooting pains in the limbs and body, had noticed a failure of vision of the right eye with a blindness of the left. Examination showed Argyll Robertson pupils. The left eye was blind, while vision with the right eye was reduced to two-thirds of normal. The form field of the right eye was reduced to two-thirds of normal. The form field of the right eye was contracted to five degrees temporally, it remaining normal in all of its other parts. Red and green were seen only at the fixation points.

The ophthalmoscope showed grey atrophy of the optic disc in the left eye with an atrophic area in the right inferior portion of the left optic nerve head.

The second case was seen in a male of fifty-five years of age who complained of weakness of vision and of fulgant pains in various portions of the body. Examination showed Argyll Robertson pupils with miosis. Vision with the right eye was one-tenth, while that with the left equaled one-fourth of normal. The form field of the right eye was moderately contracted in all meridians except the temporal, at which place it was brought almost to the fixation point. The field of vision of the left eye was similar except that the temporal part was contracted to five degrees from the fixation point.

The opthalmoscope showed atrophic changes in the optic nerve heads. The knee jerks were absent. A few months later the fixation points were involved, leaving an insufficient vision for the patient to guide himself.

The third case was in a fifty-four year old man, who together with the usual ocular signs of tabes, complained of poor vision with the right eye. Vision with left eye was normal. The form fields were badly shaped and sized, but perception for red and green with the right eye was lost. Vision with the right eye rapidly failed until it was finally reduced to light-perception. Vision with the left eye remained practically normal but with a slight contraction to the temporal side of the visual field. Six months later, vision with the left eye was reduced to two-thirds, and the temporal field had contracted to five degrees from fixation point, the other meridians remaining normal.

The author says that in cases suffering from this form

of contraction of the visual field, the vision may remain useful and fairly constant until the involvement of the fixation point, when the loss is great and rapid—and therefore, the patient should be warned of such a contingency. He believes that in the ordinary type of optic atrophy, the patient has due notice given him by the more gradual progress of the visual loss. Of the above cases, one only gave even a possible history of syphilis—a proportion of one-third, he says, which in the author's experience, has been the usual ratio between tabes and syphilis as causative factors of the condition.

A Cystitome.

LANDOLT, Paris, (*Archives d'Ophtalmologie*, February, 1902.) Landolt has had a cystitome with a blade much larger than that of the Graefe instrument constructed. The size of the blade permits of it being sharpened and thus renders the instrument more efficient for laceration of tough capsules.

Paralysis of the External Oculomotor Nerve as the only Symptom of a Traumatic Rupture of the Internal Carotid Artery in the Cavernous Sinus.

NUEL, Liège. (*Archives d'Ophtalmologie*, December, 1901.) Nuél gives the case the history of a boy of fourteen years of age who received an injury at the internal angle of the left eye from the pointed end of an umbrella rib. Immediately afterwards he became temporarily unconscious. this being associated with vertigo, vomiting, and cephalalgia. At the first examination there was ecchymosis of both lids, especially the lower, in the inner half of which there was a small wound.

Three weeks later the patient complained of diplopia and strabismus. Objectively, nothing could be observed but a complete paralysis of the external rectus muscle and the slight wound scar. An ophthalmoscopic examination however was neglected.

Three months after this, the patient suddenly died of an apoplectiform attack, having never developed any other subjective or objective symptoms. Postmortem examination revealed the presence of a diffuse hemorrhage at the base of the brain, this being especially marked on the left side. The hemorrhage had also slightly invaded the lateral ventricles. Upon lifting the brain, a varicose dila-

tation of the left cavernous sinus backward was found, the rupture of which had produced the fatal hemorrhage. Detailed dissection of the varicosity revealed a small perforation in the anterior and posterior areas of the internal carotid cavity within the sinus. The abducens nerve was fixed on the posterior surface of the sac and was atrophied from elongation. The various veins leading from the sinus, and the surrounding osseous structures were normal. The author believes the artery was injured directly at the time of the accident with a later development of the arteriovenous aneurism.

The author reviews the literature on the subject and finds that paralysis of the abducens nerve is very frequent, and often the earliest symptom of vascular dilatation situated in this region either with or without exophthalmus, subjective and objective bruits, and palsy of the other ocular nerves. In cases of injuries to the head, he has found that paralysis of abducens nerve has usually been held to indicate a fracture of the petrous bone, yet there are, he says, only four cases on record where the condition could be thus explained and in which there was an absence of lesion of the carotid artery. The author therefore hopes that the case reported by him will more frequently lead to the suspicion of a lesion of the carotid artery or of the cavernous sinus in cases of traumatisms to the head.

Pathogenesis and Treatment of Glaucoma.

PANAS, Paris. (*Archives d'Ophtalmologie*, February 1902.) Panas reviews the pathogenesis of glaucoma and supports the retention theory. He however mentions those rare instances of undoubted glaucoma in which the occlusion of filtration angle is absent and in which there does not seem to be any demonstrable cause. He states that even although neither the hypersecretion or the retention theory explains the curative action of iridectomy, yet the permeability of the operative cicatrix, which has been advanced as a reason, has not been proven.

The author believes the curative action of the operative procedure may be compared with the beneficial effects following simple laparotomy, and the abortive treatment of parenchymatous orchitis by dissection of the tunica vaginalis; and in consequence, advocates that a free open-

ing near the old scar should be made in glaucomatous eyes that have been iridectomized; an operation called culetomy. He, from anatomical studies, finds the true filtration angle placed more or less behind the base of the iris, and has therefore in ten cases, practiced an operation in which he opens the retroiridian space which is bounded anteriorly by the iris, and posteriorly by the heads of the ciliary processes, the zonule of Zinn and the crystalline equator: a space that equals two or three millimeters in width. Furthermore, he introduces a Graefe knife two millimeters back of the clear corneal margin and two millimeters above a tangent to the inferior corneal limbus. Thus placed, the knife overlaps the crystalline equator one-half of a millimeter; but injury to the latter is considered improbable.

In the ten cases so operated on, two were hemorrhagic in type, and eight were absolute in character. The first two were definitely and permanently improved, but one of the latter class was benefited.

In those cases that were improved, there was an abundant escape of aqueous humor at the operation, while in other cases, the amount was small. In the latter cases, the author asks may there not have been either an edematous infiltration of the vitreous humor or an accumulation of fluid beneath the chorioid; in which condition no operation would have been of any benefit.

Iridosclerotomy is briefly mentioned and described.

The author has practiced combined keratectomy, instead of enucleation in chronic painful absolute glaucoma without any bad results and with a consequent cosmetic advantage.

Two classes of chronic glaucoma are now described: one, with excavation of the optic nerve head, periodic increases of tension, and colored rings; these symptoms being associated with but little or any scleral hyperemia and slight corneal haze, while the anterior chamber and pupil may remain normal. In the other class, excavation of the optic disc is present, intraocular tension is not increased, and there are not any subjective symptoms except a progressive loss of vision. By many authorities, he says, these types are called cases of senile atrophy. He also states that the color and the form fields are never of suffi-

cient value to always correctly determine the condition. For these reasons he has proposed the performance of a determinative anterior sclerotomy which would enlarge the visual field in glaucoma but would not have any effect upon that of simple atrophy. Abadie, he says, has likewise proposed the use of miotics and mydriatics as determiners.

In all distinctive chronic cases the author prefers an immediate operation—preferably an iridectomy with a large section of the sclerocorneal limbus. He employs the same procedure for the acute and the subacute forms of the disease.

The use of miotics he believes, is to be practiced only as they seem to be of progressive value. For this purpose he prefers the oily solution of eserin because he has found it to have marked antiglaucomatous properties and it never produces unpleasant local effects; the absence of the latter results being explained by the non-existence of rubeserine into which the oily solutions never degenerate. The cases representing as many different types of the disease, are reported in detail in which this solution in a one per cent. strength was employed in association with frequent applications of hot compresses, at first three or four times daily. In all of the cases, the good effects of the drug were both marked and permanent.

He believes that in those cases of chronic glaucoma in which all other means fail, excision of the cervical sympathetic may be done. From clinical and laboratory experience, however, the author has found that the hypotonicity as well as the conjunctival hyperemia, contraction of the palpebral fissure, and retraction of the globe, are temporary; the miosis alone being permanent. Of the fifty-five cases cited in the work of Ziehe and Axenfeld, those of chronic simple glaucoma alone were benefited in the sense that in some the visual field was enlarged and central vision was improved; but the postoperative period still being too short, such results could easily lack permanence, and therefore at present, do not in any way justify the preference of such an operation as that of iridectomy.

In cases of pure senile atrophy, electricity and the hypodermatic use of strychnin are advised.

An Historical Point in the Operation for Strabismus.

ANTONELLI, Paris. (*Archives d'Ophtalmologie*, Janu-

ary, 1902.) Antonelli has written a critical digest of the history of the connection of John Taylor with the operation for strabismus.

The author states that while surgical intervention for correction of the squinting eye was first mentioned by Taylor in the *Mercure de France* for June 1737, yet Taylor limited the operation to a slight division of the conjunctiva and capsule, at the same time covering the normal eye, and thus obtained fixation of the operated one. He pretended to cut a nerve filament which functioned the overacting muscle and thus weakened the muscle and established equilibrium.

Antonelli also states that Taylor never thought of tenotomy or any other rational operation for strabismus of whose pathogenesis he had but an imperfect and disordered conception. Finally, he states that Taylor's famous operation was in reality merely the proceeding of a charlatan; neither the first, nor unfortunately the last, in the history of medicine.

A Special Point in the Symptomatology of Certain Ocular Paralyses.

LANDOLT, MARC, Paris. (*Archives d'Ophtalmologie*, February, 1902.) Landolt reports two cases of ocular palsy in which the vision of the unaffected eye was considerably less than that of its fellow, thus leading to the use of the affected eye for fixation with the development of a false image with the latter.

To determine the eye and the muscles that are affected in such a case, the use of the perimeter in order to determine the fields of fixation should be employed.

Palpebral Horns.

TERSON, Paris. (*La Clinique Ophtalmologique*, 10th March, 1902.) In a recent thesis Terson says Zarzychi reports nineteen cases of palpebral horns. In it he states that the affection is slightly more frequent in women, and usually occurs after forty years of age. The horns are of variable size, the longest one there noted being four centimeters in length as reported by Shaw.

Of the five cases studied by the author, the shortest was five millimeters in length and the longest was thirteen millimeters. One of the cases is of interest by reason that a sister was effected with melantic epithelioma of the

limbus of the cornea and another sister had a fibroymyoma of the uterus. A grandmother of the case had died of uterine cancer and a brother of gastric cancer. This case would therefore probably prove that although the horns are growths of a benign character, yet they may bear an hereditary affinity to other tumors.

It is of interest to note in this connection that recently Bruault has discovered that glycogen is abundant in malignant tumors and is absent or almost so in benign growths. In the cases just cited, glycogen was present in small quantities.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

BY

J. GUTTMANN, M. D.

NEW YORK.

(Quarter ending March 31, 1902.)

Two Cases of Papillitis Caused by Iodoform Poisoning.

MOHR. DR. M. (*Ungarische Medicinishe Presse*, October 10, 1901.) Since asepsis took the place of antisepsis in surgery there remained among the antiseptica only iodoform, which on account of its specific action, is used in certain tuberculous affections of the bones. The symptoms of iodoform poisoning in the eye are phlyctenæ, miosis, amblyopia, strabismus and suppuration of Meibomian glands. Papillitis and papilloretinitis with hemorrhages on account of iodoform poisoning was first noticed by the writer in the following two cases:

(I) Thirteen-year-old boy was suffering from cold abscesses in the coxæ. Six injections of a 10 per cent. iodoform emulsion, 130 grm. each, was injected in the vicinity of the abscesses. Thereupon there appeared dizziness and the vision diminished. Ophthalmoscopic examination showed papillitis in both eyes.

(II) Thirteen-year-old boy was treated for two large cold abscesses with seven injections of iodoform emulsion, 30 grm. each. Two months later there appeared also a papillitis on both eyes, which gradually disappeared.

A Very Unfortunate Case of Glaucoma (the Case of Emil Javal).

SIKLOSY, DR. J. V. (*Pester Medicin. Chirurg. Presse*, January 12, 1902.) The case was reported by the patient himself, Emil Javal, one of our most prominent writers and authors on physiological optics.

Dr. E. Javal was afflicted with acute rheumatism at the age of 35. For 20 years he was suffering from tinnitus aurium, later he became partially deaf.

In the year 1881 he first noticed prodromal symptoms of glaucoma, dilatation of the pupil and increase of tension. In spite of the use of eserin his power of vision gradually diminished. There was no pain and no signs of irritation.

In 1885 an excavation was diagnosticated and after a new glaucomatous attack sclerotomy was performed on November 11th.

The bandage was removed five days after the operation. The power of vision on the operated eye had diminished. Entopic symptoms of light in the morning.

November 30th cocain was used in addition to the instillation of eserin. After that the pupil became greatly dilated and a very severe attack followed. Three days after vision had decreased to 1/2. On December 3d, 1885, another sclerotomy was performed.

On December 11th, 1885, an iridectomy upward. The eyeball remained hard even after the operation. The iris is pushed against the cornea. The pain is considerably increased, whereas before the operation there was hardly any pain.

One month after the operation the patient is allowed to take a walk. After that a new, very severe attack follows. The tension increases greatly. Salicylate of soda and morphine was administered.

In a few weeks the remaining power of vision was lost; there remained only a slight perception of light.

Ten weeks after the iridectomy another posterior sclerotomy was performed. Two weeks after that synechia were noticed and atropin administered. In course of time the cornea becomes hazy and there appeared deposits on the lens; a detachment of the retina and floating opacities of the vitreus are noticed. Tension + 1. On March 16, 1900, the eye was enucleated. The microscopical examination showed a total detachment of the retina, the papilla excavated. The retina was full of hemorrhages, the iris atrophied and leaning against the cornea.

Subsequently the left eye also became affected and the patient saw colored rings for the first time in August, 1885. This phenomena repeated itself every week. In 1897 instillation of pilocarpin was used daily. On February 10th there was noticed a paleness and excavation of the papilla. The pupil is fairly dilated, vision fairly normal,

field of vision normal. In the end of 1899 the field of vision became limited downward. On February 7th, 1900, iridectomy and punctio scleræ were performed. The anterior chamber was restored after five days. The power of vision, however, diminished daily. The tension increased. Pilocarpin was used.

February 20th punctio scleræ, transversal 4 mm. below the limbus. On March 23d vision had fallen to 1/10. On April 8 a large absolute scotoma was noticed. Vision: 0. Perception of light is 1 m. On June 25th the superior ganglion of the sympathicus was extirpated. The lobus auricularis and the lower maxilla loose their sensibility. Since one year the perception of light diminishes also.

V. Wecker considered the case of Javal as a case of hemorrhagic glaucoma. Javal himself states that his eyes showed a high degree of inverse astigmatism and that the increase of astigmatism was the onset of the glaucoma.

Remarks Upon Diagnosis in Ophthalmological Practice.

WOLFBERG, DR. (*Medicinische Blatter.*, January 9th, 1902.) The writer does not concern himself much with the usual methods of diagnosis, but speaks only of certain easily noticed though often unobserved symptoms by means of which an important diagnosis can often be made.

As an illustration of this fact he cites a case of ablastic retinæ, which A. V. Graefe diagnosed immediately upon the patient's entrance. Excessive myopia could be diagnosed from the protruding bulbi, the bluish sclera, and the divergent strabismus. Amblyopia could be made out by the fact that the patient had to be led. The conclusion of ablatio retinæ was now comparatively easy.

A foreign body in the eye can often be diagnosed from a distance by an experienced oculist. The general redness, the abundant lacrimation and the frequent winking of one eye all lead to such a diagnosis. Changes in the pupil are often recognized from the distance already. Intra-bulbar tumor, especially glioma, can often be diagnosed from distance by the whitish luminous mass behind the pupil and the shallow anterior chamber.

The Probing of the Ductus Lacrymalis from the Nose.

POLYAK, DR. (*Ungarische Medicinicche Presse*, January 30th, 1902.) The writer considers probing of lacri-

mal duct from the nose indicated. (1) Where the affection is not yet of long duration, (2) where the affection is due to a nasal trouble, which has already healed. (3) Where the stenosis lies in the lower part of the canal, and where the treatment from above is of no avail.

Contraindicated is probing from the nose. (1) In stenosis in the upper part of the duct, (2) in such changes of the walls of the lacrimal sac, where cure is not expected even after the removal of the stenosis, (3) by children, where on account of the narrowness of the nostrils, instruments cannot be used.

Two Cases of Traumatic Expulsion of the Lens.

BLYSMA, R., Dr. (*Medicin. Chirurg. Centralblatt*, Feb. 7, 1902.) The first case was that of a sixty-five year old laborer. The patient being drunk fell on the handle of a wash wringer. The fall was followed by a marked exophthalmos, swelling of the lids, suggillation of the conjunctiva, etc. After several days of rest in bed, and ice compresses the blood was reabsorbed and an opthalmoscopic examination of the eye could be made. The eye was movable in all directions. No symptom of a deep inflammation, no pain on pressure. The tension of the eye was slightly diminished. Upon the sclera situated between the external and superior rectus, there was a dark linear scar about 20 mm. long, 2-5 mm. beyond the corneal margin. There was a coloboma of the iris, and the torn portion of the iris had healed into the wound. The pupil was dark, very much dilated and contained a small part of the capsule of the lens. There was no no change in the interior of the eye except aphakia.

Beneath the conjunctiva, between the inferior and external rectus there was a small prominence, somewhat hard, which the writer thought to be a splinter of wood. But incision showed the prominence to have been produced by the lens. The after treatment was usual. Vision 6/24 w. + 12 D. J, w. +16 D. There was a very small loss of vitreus, as immediately after the expulsion of the lens, the iris and a portion of the capsule of the lens had completely closed up the scleral wound.

The second case was that of a peasant woman, forty-nine years old, who was gored by a cow about ten weeks ago. The eyelids were normal. The mobility of the eye

in all directions normal. The eye is diminished in size; pericorneal redness, no pain except on pressure, tension is diminished. Upon the sclera between the superior and external rectus there was a large dark retracted scar 20 mm. long, situated about 6 mm. beyond the corneal margin, the iris had been incarcerated and had healed into the scar; coloboma of the iris; the pupil was filled with blood; no anterior chamber, no red reflex V = O. Diagnosis: Phthisis bulbi. Treatment: Enucleation.

Examination of the enucleated eye showed aphakia; and solutio chorioideæ.

Treatment of Trachoma.

GOLDZIEHER, PROF. (*Wiener Medicinische Wochenschrift*, March 1, 1092.) The writer deals with the pathology of trachoma. He says, that whereas the microorganism of trachoma is as yet unknown, a good definition of trachoma would be a chronic infiltration of the conjunctiva and tarsus with lymphoid masses combined with abnormal secretions of the conjunctiva. The infectious nature of the disease depends upon this secretion, the more secretion the stronger the possibility of infection; the infection, does not take place through the air, but through direct inoculation of the secretion into the eye. This would show that trachoma with or withont secretion is not infectious. The microscopical examination shows that we have a proliferation of the superficial layers of the epithelium, and a dense lymphoid infiltration of the conjunctiva, which penetrates even the deep layers of the tarsus and on some places it shows circumscribed conglomeration of cells, which appear on the surface in form of granules of the conjunctiva. But neither the diffuse infiltration of the mucous membrane nor the granules have a specific anatomical character, which will give them an absolute trachomatous character, they differ from other deep infiltrations of the tissues in chronic inflammations of the conjunctiva only quantitatively, nor are the granules very characteristic of the affection for they are also seen in a great number of other affections of conjunctiva, and on the other hand again the granules are sometimes entirely absent in the most infectious form of trachoma, namely, by the mixed blenorrhoic form. The granule by itself is not characteristic, as it forms only a

local conglomeration of lymphoid, adenoid cells, which form the deep conjunctival infiltration. It is practical to divide trachoma into two large groups, the first of which is characterized by the abundant blenorrhœic secretion. The other is characterized by the round gelatinous masses which elevate the epithelium. Experience shows that the sooner we are able to remove from the conjunctiva the pathological infiltration, which appears either as isolated follicles or as masses filling up the whole mucous membrane, the sooner we effect a cure. This result is easiest obtained in the granular form of trachoma, in the trachoma verum Arltii. Much more difficult is the treatment of those cases, where we have as yet a blenorrhoic affection of the epithelium, as in these cases we have not only to remove the deep infiltration of the mucous membrane, but also the abnormal secretion, which is the only source of infection and a medium for propagation of the affection. In the pure form of follicular or granular trachoma nothing tends better to reduce the infiltration of the surrounding mucous membrane than to thoroughly break down these granules.

The removal of the follicles can be accomplished by piercing and squeezing or by galvanocautery. But where are a great number of these granules, or where the whole tarsus is filled with a gelatinous infiltration, this galvanocautery is insufficient and we gain our object better by a thorough and radical removal of the infiltration of the conjunctiva by expression.

The expression of the infiltration can be accomplished with the nail of the thumb. By this the epithelium is ruptured in several places and the greater part of the deep gelatinous masses can be removed. This method however is crude and unsurgical. This method is very useful when used as a massage of the conjunctiva in certain forms of gelatinous trachoma.

The expression is best accomplished by Knapp's rolling forceps. A disadvantage of this method is that it is very painful and therefore in most cases can be done only under narcosis. In order to avoid narcosis this method can be used also under local anesthesia by injecting cocain or eucain under the conjunctiva. The after treatment consists in application of cold applications. After submucous injection of cocain the edema after the operation

is greater. For a few days after the expression the conjunctiva shows a grayish croupous membrane. During this time sublimate irrigations 1:1000 are indicated. After the disappearance of this membrane a 1 per cent. solution of silver of nitrate should be applied which facilitates the healing of the conjunctiva. Previously these cases were treated indiscriminately by cuprum sulphuricum which constantly irritated the conjunctiva producing traumatic keratitis and subsequently pannus.

The pannus trachomatosus has the same origin as the marginal miliary infiltration of the cornea in chronic catarrhal conjunctivitis. If therefore a local irritant such as cuprum sulphuricum is applied the pathological vascularization of the cornea is increased and the process is aggravated. The writer therefore is very careful to avoid the formation of pannus and in cases where panus is developed he avoids all irritants of the conjunctiva and treats the same as a keratitis. In case this mode of treatment is not sufficient he resorts to surgical interference such as curettage of the infiltration or of the small marginal ulcer, to which abnormal blood vessels lead.

In the fully developed pannus trachomatosus he achieved the best results with the galvanocautery.

ABSTRACTS OF GERMAN OPHTHALMIC LITERATURE.

BY

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(Quarter ending March 31, 1902.)

Aspirin in Diseases of the Eye.

KIRCHNER, HANS, DR. *(Die Ophthalmolog. Klinik.*, No. 18, 1901.) The author has used this product with happiest results in acute iritis. Cases which failed to yield to the salicylate of soda and salol were markedly benefited by the administration of aspirin. The value of aspirin was not only seen in inflammations of rheumatic origin but in iridocyclitis from a variety of causes. The pain in this class of cases seems to vanish as if by magic under the influence of aspirin. Cases of scleritis and abducens paralysis were apparently uninfluenced. The author reports a case of iritis serosa where the pain disappeared and the exudates were absorbed under the administration of aspirin. Supraorbital neuralgia was promptly relieved, particularly the very acute cases. Headaches of obscure origin were dissipated by aspirin so also headaches where the cause was known, but which had failed to yield to the usual remedies. Generally speaking fifteen grains were employed at a dose, and this dose was sufficient to relieve the trouble. More than thirty grains were never necessary.

The Condition of the Ciliary Nerves in Phthisis Bulbi.

NAITO, DR. *(von Gräfe's Archiv. für Ophthalmologie*, LIII Bd. I Heft.) The author's conclusions which are

based upon an anatomical examination of a shrunken eyeball are as follows: 1. It is probable that a proliferation of the nerve trunk occurs in the atrophic eye, perhaps if the ciliary nerves have been either cut or injured within the eyeball.

2. Histologically it is difficult to prove the presence of this proliferation since the shrinking which takes place in such eyes can crowd together the nerves which are normally present so as to make them occupy a smaller space and in this way we can be deceived by getting an apparent increase in the number of nerve fibres. Hence it is difficult to say to what degree the relative increase in nerve fibres occurs.

3. There is undoubtedly a proliferation of opaque nerve fibres in the cornea. The number of intraocular nerves can be conspicuously large in such an eye to such an extent indeed as to be out of proportion to the remaining tissue of the eyeball. It is easy to understand then the presence of so many nerves the recurrence of inflammation and marked irritative symptoms. It is easy to understand too why we have in ossification of the choroid a return of irritative symptoms because we have pressure upon these nerves by the bony mass and such an irritation can no doubt give rise to an exacerbation or relapse of an inflammation which had been for some time quiescent and this is probably the explanation of the cases of sympathetic ophthalmia which are seen under such circumstances.

Corneal Edema in Glaucoma.

STOLTING, DR. (*Klinische Monatsblaetter für Augenheilk*, August, 1901.) The loss of the corneal lustre and the presence of roughened areas on the surface of the cornea is caused by an edema of the latter. The position of the ligamentum pectinatum (which is displaced) interferes with the easy passage of lymph through the regular channels and some of it finds its way into the corneal lamellæ.

Traumatic Thrombosis of Central Vein of the Retina.

WISER, DR. V. (*Centralblatt für prakt. Augenheilk*, December, 1901.) The author reports the case of a workman who had been struck in the eye by a piece of iron. A fellow workman examined the eye and removed particles of dirt and stone. The injury consisted in a considerable

excoriation of the cornea and in marked irritative symptoms. These symptoms disappeared in eight days, but there was still some difficulty in moving the eyeball. The pupil remained large and the vision was reduced to 3/50ths. When first examined ophthalmoscopically the optic nerve entrance was found surrounded with hemorrhages, many of which were flame shaped and extending over a large area. The vision now was reduced to the ability to count fingers in a few feet. A careful physical examination failed to reveal any heart lesion. As has been said there was some difficulty in moving the eyeball after the accident, and this was supposed to have been due to an extravasation into the orbit behind the eye. The presence of this extravasation not only caused disturbances in movement but also compressed the central vessels and secondarily lead to thrombosis of the vein.

Eye Disease and Hay Fever.

FRANKE, DR. E. (*Zeitschrift für Augenheilk.*, December, 1901.) The author discusses the form of conjunctivitis seen in hay fever. It is coincident with the cold in the head and appears and disappears with the latter. In other respects it does not differ from the conjunctivitis which we often see with an ordinary cold in the head. We notice individual peculiarities, for while some are hardly bothered with the eye trouble others are very much afflicted and the nasal symptoms are practically in the background. Franke does not think that the conjunctivitis is toxic or infectious in character. The treatment of the disease is about as unsatisfactory as that of the nasal affection. Cold applications are recommended, but their effect is only transient. The various remedies for conjunctivitis may be employed, but Franke has gotten the best results from the employment of a solution of holocain. He has gotten better results with this than with cocain. The photophobia may be relieved by colored glasses.

The Diagnosis, Prognosis and Treatment of Infected Perforating Wounds of the Eyeball.

SCHIRMER, DR. (*v. Gräfe's Archiv. für Ophthalmolgie*, LIII, I. Heft.) The author has been so much struck with the efficacy of mercury in the treatment of sympathetic ophthalmia that he has made its use the routine measure in handling perforating wounds of the eye. In sixty per

cent. of fibrinous uveitis and in sixty-five per cent. of purulent uveitis he has been able to obtain a more or less amount of useful vision. It is exceedingly important to administer the remedy promptly and it should be given in large doses. Inunction is the method usually employed and as much as eight or nine grammes are used in the case of men and somewhat less when women are the subjects. In children from one to three grammes according to the age. Generally half of the ointment is rubbed in in the morning and the other half at night. Intramuscular injections are sometimes employed when an especially rapid action is desired (that is to say, a hypodermic syringe full of this mixture. Hydrarg. biniod. 0, 25, Potass. Iod. 2, 5 Aq. dest. 25, 0). The treatment must be kept up for a considerable time. In addition to these measures atropin, moist heat, bandage and rest are necessary. Touching the edges of the wound with the galvano-cautery is often done and sometimes the wire is introduced right into the anterior chamber. Subconjunctival injections of sublimate and of salt have proved beneficial and the salt solutions should be gradually increased in strength. Mild diaphoresis and finally the introduction of iodoform rods into the anterior chamber as suggested by Haab, Ostwalt and others. He cautions against operative measures, for such a step is liable to bring about a relapse, and in fibrinous cases at least six months should be allowed to elapse before an operation is admissible.

The chief points in the communication are these: Infectious inflammation which follows a perforating wound of the eye localizes itself generally in one or more parts of the uvea or of the vitreous body. The inflammation makes its appearance in three forms. 1. Serous iritis. 2. Fibrinous iritis. 3. Purulent iritis. In abscess of the viteous one finds anatomically hyperemia and infiltration of the retina and choroid and of the two the retina is more often affected. The three forms of uveitis are not sharply separable from one another, but often pass over into one another or they may exist in the same eye. It is to be specially noted that fibrinous uveitis is rarely associated with abscess of the vitreous. The prognosis is especially bad when we have in addition to a penetrating wound of the vitreous body an abundant exudate in the anterior

chamber and sensitiveness to the touch a few days after the injury. The prognosis of serous uveitis is good and of the other two forms moderately good.

The Treatment of Retinal Detachment After the Method of Dor.

GALLUS, DR. (*Zeitschrift für Augenheilkunde*, December, 1901.) In 1895 it will be remembered that Dor made known a method of treating retinal detachment which consisted in cauterizing the sclera over the point of the detachment and at the same time he injected a salt solution under the conjunctiva. Finally the artificial leech was employed. Of course absolute rest in bed was required. He reported fifteen cases with nine cures. Gallus has tried this method in eight cases. In every case there was a re-attachment of the retina in about eight days after the commencement of the treatment; in other words, where it could be safely said that a primary subretinal exudate was causing the detachment, and if the exudate had not been present too long a re-attachment of the retina was invariably seen when the treatment was faithfully kept up for weeks. Generally the vision improved. The method is also beneficial in cases of relapse. Gallus concludes his communication by expressing some scepticism as to the permanency of the cure inasmuch as several of his cases have suffered relapses. He is of the opinion, however, that the treatment is far ahead of the usual methods of treating detachment of the retina.

Extraction of a Piece of Steel From the Lens Without the Formation of Cataract.

SACHER, DR. M. (*Zeitschrift für Augenheilkunde*, October, 1901.) The case was one in which there was characteristic injury by a piece of steel which had flown into the eye. The particle had passed through the cornea, penetrated the lens at the lower outer side and remained imbedded in the latter near the posterior capsule. As is generally the case the particle of iron had been detached from the instrument though the patients usually tell us that a piece of the material which is being worked upon has flown into the eye. In this case the patient said a piece of stone had struck him in the eye. The remarkable point in this case was that in spite of the extensive injury to the lens and of the fact that the foreign body had remained eighteen days within the lens no cataract had fol-

lowed. A slight clouding which was present at first had entirely cleared up. The piece of iron was extracted by way of the same channel as that of entrance. It is extremely rare that we have such extensive injury of the lens without the formation of cataract.

Cataract Operations in India.

POPE, DR., Madras. (*Centralblatt für praht. Augenheilk.*, September, 1901.) Pope has had an immense experience in this class of cases. In the last ten years he has operated upon twelve thousand cataract cases. In the cortico-nuclear form his successes ranged from 91 per cent. to 92 per cent. and in the hard cataract he had 92 per cent. of successes. The cases were generally operated upon early Saturday morning and most of them left the hospital the following Thursday, though they were kept under close observation for five days longer. Three days before the operation atropin is dropped in and a bandage is applied and the next day the eye is irrigated with a boric acid solution, and this is repeated the following day and also the day of the operation, when the eyelids and brows are washed. The instruments with the exception of the cataract knife are boiled in a carbolic acid solution and then placed in a cold carbolic acid solution. The cutting instruments are kept in absolute alcohol. The eye is anesthetized with a 4-6 per cent. solution of holocain. After the introduction of the speculum the eye is flushed with a 1:100 solution of carbolic acid. The next step consists in piercing the anterior capsule, which is done by introducing a Bowman needle through the scleral border. The corneal section is then made above, which includes more than a third of the cornea, and a conjunctival flap is always made. Simple extraction is the operation which is usually performed. After the operation any drop of blood which may be present is cleared away and then a few drops of glycerin solution (5 per cent.) is dropped into the eye and iodoform is dusted over the surface of the eyeball. Antiseptic cotton over which white vaselin is spread is then applied over the lids and iodoform dusted over the whole. Both eyes are closed. The bandage is changed the next day and removed for good on the fourth day. In twenty-five cases no bandage was used and with no bad results.

Cuprol.

SICHERER, DR. V. (*Die Ophthalmologische Klinik*, 5 December, 1901.) This product contains about six per cent. copper, and it is readily soluble in water. In solutions containing albumen no coagulation is seen on the addition of cuprol. The solution which is generally used is a ten per cent. one, to which it is well to add 1/2 per cent. of chlorotone. It is best to make the solution in warm water. In a solution of this strength there is practically no pain when dropped into the eye and there is the minimum amount of irritation to the conjunctiva. Sometimes after ten or fifteen minutes a slight burning may be felt, but this is only transient. In acute and chronic conjunctivitis the use of cuprol will be followed usually by a rapid disappearance of the redness and secretion. It is also valuable in phlyctenular conjunctivitis. In cases of chronic conjunctivitis where other remedies fail it is of value. In phlyctenular conjunctivitis one can employ either the solution or the powder. Schnell has found that cuprol penetrated more deeply into the tissues than the other copper salts, and hence he suggested its probable value in trachoma. The chief advantages then of the agent are its relatively slight irritating properties and its greater powers of penetration.

The Atheromatous Ulcer of the Cornea.

FUCHS, PROF. DR. (*v. Graefe's Archiv. für Ophthalmologie*, LIII Band, I Heft.) It is well known that in thick corneal scars. also in staphylomatous conditions of the cornea, we often have regressive metamorphosis consisting in the formation of hyaline masses in the cornea and in the deposit of lime salts in the same locality. Sometimes we find in these scars ulcers which are thickly coated with pus and on the floor of which we will often find small calcareous particles lying loose. These ulcers have the peculiarity of often extending into the interior of the eye and causing panophthalmitis. This ulcer is known as the atheromatous ulcer and in such a condition we have a necrosis of the badly nourished scar tissue of the cornea. This necrosis is sometimes found in the superficial layers and again may be found in the thickness of the cornea. The provocation to necrosis is caused by the entrance of bacteria, which entrance is favored by the diseased condition

of the epithelium. The necrotic portions are thrown off as sequestra which often find their way into the interior of the eye. This sort of an ulcer differs from an ordinary ulcer in that it is not primarily an infiltrate like the latter, but is primarily necrosis. This ulcer somewhat resembles the serpent ulcer, but is different from the latter in that the necrosis goes no further than is necessary for the sequestration of a given portion of the corneal tissue.

A Rare Form of Eye Injury.

QUINT, DR. (*Centralblatt für prakt. Augenheilk.*, October, 1901.) The author reports the following singular case. A workman had been struck over the eyebrow with a piece of board from a box on which he had been working. When seen there was a slight gaping wound below right eyebrow near the external canthus. There was however no wound of the eyeball though there was some puffiness of the conjunctiva in this neighborhood. The pupil was a little irregular but dilated perfectly under atropin. At some distance from the macula there was to be seen a slight tear in the retina and choroid and one could see distinctly through this rent that the sclera was also torn asunder. The wound through the sclera ran obliquely backward and outward and then inward and forward. Out of this wound projected two fine looking objects which looked like hairs and which extended right into the vitreous.

In short there was an opening into the back of the eye without any evidence of injury to the anterior segment of of the eyeball. The following was the explanation given by Quint. The piece of plank with which he was struck had two curved nails (3-4 cm. long) sticking in it. This end of the plank had struck the eyebrow and its curved nails had pierced this region passing back behind the eyeball and cutting the latter in the peculiar way which has been described. Two of the hairs of the eyebrow had been carried along and were as has been said projecting from the wound into the vitreous. Several weeks later the inflammatory changes around the wound had disappeared and there was a dark spot in the field of vision corresponding to the scar while the position of the hairs remained the same. Vision was about 1/2.

The Chalazion Bacillus.

HALA, ADOLPH, DR. *(Zeitschrift für Augenheilk.*, November, 1901.) The author gives us an analysis of twelve cases of chalazion where bacteriological and histological examinations were made. He also made a number of experiments on animals. His conclusions are as follows. Chalazion from an etiological point of view is an infectious process. The bacilli which are regularly found in the chalazion and that too in considerable quantity are in every way identical with the so-called xerosis bacillus described by Kuschbert, Neisser and Leber. The xerosis bacilli which are so often found in the normal conjunctival sac and also in various forms of conjunctivitis probably get into the tissues by rubbing and when once in the tissues they grow and give rise to the process called chalazion. The various forms of catarrhal conjunctivitis and asthenopia too predisposes to this variety of infection with the xerosis bacillus. In short the chalazion is not a retention cyst and it has no connection with the tuberculous process.

The Explanation of the Pain Following the Exposure of the Eye to Dazzling Light.

NAGLE, W. A. *(Klinische Monatsblätter für Augenheilk.*, Nov., 1901.) It is well known that when one has been in the dark for a little while and then suddenly exposes the eyes to brilliant light not only is the effect very dazzling but that there is a sensation of actual pain. Von Frey has reminded us that the optic nerve has nothing to do with this sensation of pain and he is of the opinion that the sensation is to be traced to the sudden contraction of the sensitive iris. This being the case the sensation of pain should be absent when the reflex action of the pupil to light is abolished under the influence of a mydriatic. Nagel has made the experiment a number of times and he has found that when an eye is under the influence of homatropin (for example) the characteristic sensation is absent. Axenfeld thinks we find verification of this in the fact that in phlyctenular conjunctivitis and even in iritis patients very often open wide their lids after the use of atropin when before the use of the latter there was the most intense blepharospasm.

Two Cases of Traumatic Expulsion of the Lens.

BYLSMA, R., DR. (*Wochenschrift für Therapie und Hygiene des Auges*, Nov. 17, 1902.) The first patient while drunk had fallen and struck his eye on the projecting portion of a wash tub. When seen it was noted that the eye was freely movable in all directions and there was no evidence of a deep inflammation. Between the superior and external recti muscles there was a long dark scar in which there was incarcerated a piece of the iris. The pupil was wide and black and there was a small piece of capsule curled up in this locality. The fundus was normal. The lens was absent. Beneath the conjunctiva between the external and inferior recti muscles there was to be seen a small hard elevation and when this elevation was incised it was found to be the lens. The healing process was normal and the ultimate vision amounted to 6/24ths with plus 12 D. The second case was that of a woman who had received a blow in the eye. She was unable to see after the accident. The general appearance of the eye was practically unaltered with the exception of a slight pericorneal redness. Tension was slightly below normal. In the sclera between the superior and external recti muscles there was a long dark line which proved to be the wound in which the iris was incarcerated. The pupil was filled with blood and there was no red reflex, the vision being O. The eye was enucleated and was found to have lost its lens which had of course come out through the wound made by the foreign body.

The Condition of the Eyegrounds in Intracranial Trouble of Otitic Origin.

HANSEN, DR. (*Extracted from Wochenschrift für Therapie und Hygiene des Auges*, No. 16, 1902.) The observations were made in Schwartze's clinic in Halle. In eleven cases of uncomplicated extradural abscess there were three cases in which there were slight fundus changes. In thirty cases of purulent meningitis fifteen showed ophthalmoscopic changes and of these thirty-three per cent. had choked disc. In four cases of tubercular meningitis there were twice marked changes in the fundus. There was also a choked disc in a case of internal hydrocephalus. In eight cases of endocranial complications seven showed ophthalmoscopic changes. In

eight cases of uncomplicated sinus thrombosis fundus changes were noted three times and in one of these there was choked disc. In twenty-one cases of complicated sinus thrombosis there were ten cases in which ophthalmoscopic changes were found. In twelve cases of cerebral abscess ophthalmoscopic changes were noted six times.

The Value of the Method of Making a New Lid by Transplanting an Area of Skin Without a Pedicle.

KUHNT, H., DR. (*Zeitschrift für Augenheilk.*, February, 1902.) Kuhnt discusses the various operations for ectropion and lid disfigurement generally and reports a number of cases (eighteen) in which the lid deformity was remedied by the above mentioned method. In seventeen of these cases an excellent result was obtained and while the remaining case was satisfactory it was not quite up to the mark from the standpoint of the others. The conclusions which the author draws from his experience with this method are as follows:

In cases where the patients are neither dyscrasic nor are suffering with some sort of suppurative trouble, the operation will be followed in by far the majority of cases with success provided the proper precautions are taken. The methods of Thiersch and Le Fort-Wolfe are equally good. Wherever we have a cicatrical ectropion or in fact any superficial defect in the lid the method is indicated and it makes no difference whether the surrounding tissue is healthy or has undergone cicatricial degenerations or whether the lid be the upper or the lower.

Iodipin in Ophthalmology.

HYMMEN, H. V., DR. (*Die Ophthalmologische Klinik.*, 20 December, 1901.) Since Pagenstecher's communication upon the good results obtained through the administration of large doses of iodid of potash when small doses were ineffective this method of administering the iodids has come into pretty general use among ophthalmologists. It has been shown that large doses of iodid of potash such for instance as twenty-five grammes can be given daily with impunity where smaller doses would give rise to the most uncomfortable symptoms. Iodipin has the advantage of leaving the stomach unchanged and is only acted upon by the digestive fluids of the intestines and

from this point is taken up into the system. It acts much less promptly than iodid of potash but it can be detected much longer in the urine than the latter, traces of iodipin having been detected in the urine fifty-three days after the last dose. Its elimination goes on very slowly and this probably accounts for its valuable therapeutic properties. Iodism has never been observed from the administration of this agent. The subcutaneous administration of iodipin offers advantages over taking it through the mouth as there is no chance in this way of irritating the digestive tract and the duration of the treatment is markedly shortened. No objectionable symptoms developed after subcutaneous injections. In cases of scrofulous eye inflammation which had resisted all other treatment improvement was seen in a short time after iodipin was used. In interstitial keratitis due to inherited lues where iodid of potash had done no good the administration of iodipin was followed by improvement, and the same may be said of the chronic forms of uveitis and also of scleritis. It seems to be peculiarly adapted then to cases where iodid of potash is either not indicated or where the use of the latter has done no good. As a general thing it seems to be called for especially in the chronic processes where the rule is to give iodid of potash for a long time.

Paraffin Injections in Ophthalmology.

(*Wochenschrift für Therapie und Hygiene des Auges*, No. 21, 1902.) It will be remembered that Rohmer and Dianoux have made several communications on the value of vaselin injections into the space left by the eye which has been taken out. There are several objections urged against this measure, chief of which is the possibility of getting a pulmonary edema, two cases of which have been reported. This led Eckstein to try paraffin, which he has found free of any objectionable features. It hardens with great rapidity after injecting into the tissues and hence the occurrence of emboli is very improbable, as there is no emigration of the particles of paraffin from the point of the injection. Brokaert reports a case where he injected this paraffin beneath the skin over the root of the nose to relieve a marked epicanthus instead of cutting out a vertical section. The result was brilliant.

Dislocation of the Eyeball.

BOCK, DR. EMIL. (*Centralblatt für praktische Augenheilk.*, Januar, 1902.) The author describes a very remarkable case where an infant came into the world with the right eye lying out in front of the lids. The recti muscles were torn away while the oblique muscles still functioned. The cornea was roughened and cloudy and the anterior chamber full of blood. The eyeball was replaced and the palpebral opening was made smaller by sewing up the angles. An abscess appeared on the thigh and a few weeks later the child died. Dr. Bock supposed that a mistake was made in diagnosticating the position of the child and that what was really a face presentation was taken for a breech and that a finger was inserted into the socket under the presumption that it was the buttocks.

The Use of Air and Water Massage for the Eye.

KAUFFMANN, DR., Ulm. (*Wochenschrift für Therapie und Hygiene des Auges.*, No. 22, 1902.) We all know that massage in eye affections is usually applied by the hand, the so-called manual massage. Its application is especially called for in diseases of the cornea and sclera as well as for maturing cataract and also for bringing about the absorption of the remains of cataract. In air massage the well known antero-posterior movability of the eyeball is utilized. The apparatus which the author has devised is a suction arrangement or air pump resembling a syringe, which fits snugly into a cup and the latter is applied closely to the lid. A forward and backward movement is produced, which is regulated at the will of the operator. When water massage is applied the little cup which lies next to the eye is half filled with water, which may be of the desired temperature, and the force is communicated to the eye through the water. The sittings should last from three to eight minutes and should be repeated once daily. Inasmuch as the method makes decided traction movement upon the eyeball it is suggested that it is especially applicable to embolus of the central artery and to optic nerve troubles, also in paresis of the motor muscles. In all cases where subconjunctival injections seem indicated the air-water massage is valuable.

Tincture of Iodin as a Substitute for Iodid of Potash.

RICHTER, DR. PAUL, Berlin. (*Deutsche Aertze-Zeitung*,

No. 4, 1902.) The author regards the tincture of iodin as a most satisfactory substitute for iodid of potash. He gives it in doses of thirty drops and over three times daily. He has found that many patients who experienced great discomfort from taking iodid of potash could take the iodin without unpleasant effects. Inasmuch as the tincture of iodin is much cheaper than the iodid of potash and has actually the same action as the latter it seems in every respect a suitable substitute for the iodid.

A Case of Phlegmon of Both Orbits With Recovery and With Preservation of Vision.

LAAS, DR. RUDOLF, Giessen. (*Zeitschrift für Augenheilk.*, March, 1902.) Double orbital phlegmon, as we know, is exceedingly rare. Most of these cases end fatally, being generally complicated with sinus thrombosis. Those which have survived have, as a rule, become blind. Only two cases are to be found in literature similar to the ones reported by Laas. In this case the severity of the general symptoms aroused the suspicion that there was a sinus thrombosis. After four weeks of suffering, during which time a number of incisions were made into both orbits, and in spite of the extremely fulminating character of the local symptoms, there was complete recovery. Blindness in such cases usually results from either atrophy of the optic nerve following neuritis or from infection following a perforating ulcer of the cornea. In the case described by Laas there had been a small furuncle at the root of the nose, which had been incised and treated by the patient's mother, and as a result infection followed. A unique complication in the right eye was a large subchoroidal exudate, which slowly disappeared after the evacuation of a large abscess under the eyeball. The author concludes his interesting communication with an exhaustive discussion of the pathogenesis of these troubles.

Treatment of Trachoma with Iodin.

MELCONIAN, DR., Beyruth. (*Klin.-therap., Wochen.*, 1902, 8.) The author uses a solution of metallic iodin 0,05 to 10 g. of fluid vaselin, or when the case is fresh and the eyes are very sensitive more vaselin should be present, say from 15 to 20 g. The application is made to the everted lids with the thumb, which is dipped into the mixture and rubbed well over the lids. There is slight sting-

ing, which lasts a few minutes. These applications should be made morning and evening, while once during the day a couple of drops of the mixture should be instilled into the eye. This treatment should be kept up till the pannus has disappeared and the lids have regained their normal appearance. While the treatment takes a little longer time than with the "blue stone" it is more reliable and leaves no scars behind.

Absorption of Hypermature Cataract Following a Non-perforating Wound of the Eyeball.

HENNICKE, DR. (*Wochensch. für Therapie und Hygiene des Auges*, No. 23, 1902.) Hennicke reports a case of an individual sixty-four years old who gradually went blind, and on consulting several oculists was pronounced to have cataract. In the course of time the cataract reached maturity, but he declined operation as his other eye still had useful vision and he was too poor to pay for an operation. When Hennicke saw him he found that the lens in that eye was gone and there only remained small pieces of opaque capsule above. His vision in this eye with a cataract glass was perfect. He informed Hennicke that when walking one day through the woods he was struck in the cataractous eye with a twig from an overhanging tree and from that time on the vision in the eye slowly improved till in six months his vision was perfect with the correcting glass.

Paralysis of Accommodation Following the Eating of Bad Eggs.

HENNICKE, DR. (*ibid.*) The author was called to see a family, three members of which were similarly affected; that is to say, they were unable to see anything clearly close at hand. Distant vision was unimpaired. There was complete paralysis of accommodation. Inquiry elecited the fact that the day before the mother and two daughters had eaten freely of eggs which they thought at the time were far from fresh, to say the least, and the eating of which had been followed by nausea and vomiting. The father alone had not eaten the eggs and he alone escaped paralysis of accommodation.

Radical Cure of Keratoconus From a Cataract Operation.

NOICZEWSKI, DR. (*Centralb. für prakt. Augenheilk.*, February, 1902.) The case was one of marked keratoconus complicated with cataract, in which the operation of ex-

traction was performed. A day or two after the operation there was noticed a slight over-lapping of the corneal lip of the wound. This portion was excised. Complete recovery and disappearance of the conus resulted and excellent vision was obtained.

First Aid in Case of Injury of the Eye From Lime.

HOPPE, PROF. DR. (*Centralbl. für prakt. Augenheilk.*, February, 1902.) We all know the disastrous consequences which often follow lime burns. These consequences may be partly averted by prompt and effectual aid which can be applid by others than those who are experts; in other words, by fellow workmen. Such aid should be so simplified that it can be readily utilized in all large workshops. For this purpose Hoppe has suggested the use of a soft gelatin tube containing white lanolin mixed with 20 per cent. holocain. These tubes are about the size of a plum and are filled with above mentioned mixture. They are kept in an air tight box to prevent the growth of bacteria upon the gelatin. As soon as the accident happens the small end or neck of the tube is thrust under the upper lid at the external canthus and pressure is then made upon the body of the tube so that the contents pour out under the lid. The same procedure is carried out with the lower lid. This treatment can be applied by any intelligent workman in the shop, and it should be done at once and as soon afterward as possible an oculist should be consulted.

On the Extension of the Sensory Spheres of the Cerebral Cortex.

MUNK, HERMANN, Berlin. (*Sitzungsberichte der Koenigl. Preuss. Academie der Wissenschaften zu Berlin*, 1899-1901.) From his investigation on the dog and monkey, M. described, two decennia ago, the cerebral cortex as an aggregate of zones, governing the different senses which he called sensory spheres: The visual sphere in the occipital, the hearing s. in the temporal, the sensitive s. in the fronto-parietal lobes, the olfactory s. in the gyrus hippocampi. In each of these spheres the sensory nervous fibres of one sense terminated, and the specific sensations and preceptions of this sense arose, and he placed the intellect, as the collection and resultant of all perceptions, derived from the sensations, over the entire cerebral cortex and not in any particular region. Since then our knowledge of the sensory spheres has been broadened and deepened

and the opposition against their existence defeated, so that we may speak of a general agreement as to the situation of the sensory spheres, not only in the animals mentioned, but also, from anatomical and pathological observations, in man. But there is still a discrepancy in regard to the extension of the sensory spheres. While according to M., the different sensory spheres border on one another, each confined to the lobe designated, others (Luciani) hold that each sensory sphere spreads from the designated lobes of the cortex more or less into the neighboring lobes, so that intermediate zones exist in which the different sensory spheres are intermingled, others (Flechsig) that each sensory sphere occupies only a small portion of the designated lobe, leaving a considerable province of the cerebral cortex which represents no sensory sphere. Both ascribe, Luciani to the intermediate zone before the occipital lobe, Flechsig to the cortical areas, which are no sensory spheres, higher functions, thus distinguishing association and cogitation centers (Denkorgaren) on the cortex from sensory spheres. Therefore, M., for a number of years, continuously investigated these questions by experiments, the method of which has been greatly improved by the aid of asepsis which is of paramount importance. They supported beyond doubt his former results, i. e., that the sensory spheres are sharply defined. With regard to the areas which so far had not been determined as sensory spheres, i. e., the cortex of the angular gyrus of the monkey and the corresponding area between the region of the limbs and the head and the visual sphere of the dog, which M. called "F" in the illustrations in his "Functionen der Grosshirnrinde," M. found by his new experiments that they are also a tactile sphere, viz.: the eye region. Unilateral extirpation of this portion of the cortex reduced the sensitiveness of the contralateral eye, bilateral extirpation caused inability to raise the upper eyelids as far as normally, to fixate normally and to recognize the positions of objects in the depth of the visual field. These disturbances thus quite correspond to the motor and sensitive alterations, found on the extremities, head and neck after extirpation of their regions.

In 1882 M. demonstrated by new experiments, extir-

pations and stimulations, the cortex of the frontal lobe as the sensory sphere of the trunk.

He concludes as follows:

There can be no doubt that the cortex of the frontal lobe is a region of the sensory sphere, the region of the dorsal vertebral column, or rather the trunk region, since not only the dorsal vertebral column is influenced by stimulations but also the respiration. In comparison with other regions of the sensory sphere the proof is still lacking, that, after extirpation of the frontal lobe, also the tactile sense of the skin of the trunk is damaged. This, however, is not important, as it is extremely difficult to regularly ascertain a deterioration of tactile sensibility, which even normally is very small.

In the 3d communication (1901) M. criticises in detail the experiments of Ferrier, Hitzig, Goltz and Bianchi, which were considered by some as supporting the theory that the frontal lobe is the area of the higher psychical functions, intellect, thought, attention, character, etc., and shows that the entire experimental material extant does not yield the least probability that the frontal cortex of M.'s trunk region and the parietal cortex of M.'s eye region occupy a special place from the remaining cortex with regard to the higher psychical functions, but all reliable experiments prove its fallacy.

With regard to the pathological results the abundant literature of cerebral diseases yields only a minute number of cases in which disturbance of the intellect, thought, character, etc., might be believed dependent upon affection of the frontal lobe. But the scrutiny of the cases does not even once show the supposed dependence, but solely that the disease of the frontal lobe in connection with other damage of the brain had caused the psychical alterations. Numerous other cases showed disturbances of intellect from disease of other cerebral lobes than the frontal lobes, but also in conjunction with further damage of the brain. Therefore these psychical disturbances can neither be attributed to the frontal lobes nor to the other cerebral lobes, but generally to the damaging of the brain in large extent. In a much greater number of cases softening, abscess, tumor and other affections of the frontal lobes remained entirely without consequences upon the psychical condi-

tion of the patients. Thus an exclusive position as to the higher psychical function aside from the remaining cerebral cortex cannot be claimed for the frontal lobe. Pathological experiences on them also agree with the experiments of M., that the lower parietal lobule must be regarded as the eye region of man.

In the last chapter M. repudiates the theory of Flechsig, who, from anatomical and embryonic (myelogenetic) investigations, infers that the cerebral cortex is composed of sensory, association and cogitation centers (Denkorganen), and rather sees in the anatomical conditions a confirmation of his experimental results and the pathological observations. M. thinks his task completed, and that it is safe to say: Neither is the frontal lobe the seat of intellect, nor are special areas of the cerebral cortex endowed with higher psychical functions, nor exist areas which subserve only to sensory actions. As the sensory nervous fibres, to the whole extent of the cortex, terminate here for each sense next to one another, without intermixture with the fibres of another sense, the cortex presents an aggregate of zones belonging to different senses; the sensory spheres. In the central elements of each sensory sphere, which are immediately, or almost, connected with the projection fibres, the specific sensations, perceptions of one sense arise. But still we are in the dark, since so far the experiment on animals is inadequate and the pathological observations in aphasia, alexia, agraphy, etc., yield very scanty and not clear enough explanations.

On Reflexes on Head and Face.

BECHTEREW, V., Hudovernitz. (*Neurol., C. B.*, 1901, No. 20.) Both authors claim the priority of McCarthy's supraorbital reflex (reviewed in the ANNALS), which B. considers as a reflex from the periosteum, H. simply as a propagation of the mechanical irritation of the frontal muscle to the orbicularis muscle, which is also supplied by the VIIth nerve. Further investigations are desirable, since it was also observed in a case after extirpation of the ganglion Gasseri on both sides.

On the Connection of General Diseases and Those of the Ocular Fundus.

LITTEN, PROF. M., Berlin. (*D. Med. Woch.*, 1902, p. 3.)

In numerous cases of septicemia and endocarditis L. observed (as early as in the 70's) changes in the fundus which, aside from metastatic ophthalmia, consist in white patches and hemorrhages in the retina, in severe as well as in light cases. They are not necessarily fatal and a resorption of the patches with recovery is possible. The affection has more a diagnostic than prognostic value. The same changes in the retina may occur in a series of chronic diseases which have in common the symptoms of hemorrhagic diathesis: Bright's disease, pernicious anemia, leukemia, diabetes, scurvy. Histologically these white patches unexceptionally occur in the layer of the nerve fibres and always at a certain place, about one-third papillary diameter from the disc. They are round or oval infiltration foci almost like tumors and never encroach upon another layer, except that they by compression form prominences toward the choroid. They consist of a structureless homogeneous hyaline mass showing a trace of striation of the layer of the nerve fibres, with remnants of nuclei of the latter. L. thinks that they are formed by a rapidly effused and very rapidly coagulating lymph exudation. This alone can explain its rapid formation, its stationary character from the start, its power of being entirely absorbed, its rapid coagulation which does not give it time to be diffused into other layers, and Weigert's staining of fibrin, which succeeded in one case. But why it always occurs at the same place could not be determined. The most careful histological investigations of L. showed that it cannot be due to embolism, but must be a process of exudative coagulation. In acute diseases this affection of the retina is of diagnostic importance in distinguishing septicemia from typhoid, acute miliary tuberculosis and tubercular meningitis. Although exactly the same kind of hemorrhage may occur in the latter, almost always papillitis or at least an intense opacity of the disc, mostly with swelling, is found which was never observed in any of L.'s cases of septicemia. He never saw white patches in acute miliary tuberculosis, but occasionally hemorrhages, which may also occur in septicemia without white patches. But in the majority of cases tuberculosis of the choroid will determine the diagnosis.

Prognosis of Glaucoma Operation.

MENDEL, DR. F., Berlin. From the eye clinic of Prof. Hirschberg. *(Berl. Kl. Woch.*, 1902, p. 71.) From Jan. 1st, 1894, to Dec. 1, 1901, 234 patients with 258 glaucomatous eyes were observed and treated. Seventy-three eyes showed acute inflammatory, 35 chronic, 87 simple glaucoma, 54 secondary, 9 congenital increase of tension. On 15 patients no operation was performed, 9 of which were successfully treated with eserin (except one). To avoid malignant glaucoma of both eyes in glaucoma simplex, H. never operates on both eyes in one sitting, but on the second after the first has recovered, and, if one eye is blind from glaucoma, on this one first. Immediately after the operation on one eye, eserin is instilled twice a day for a week into the second, apparently healthy, eye to prevent an outbreak of glaucoma. In acute and chronic inflammatory glaucoma iridectomy gives the best results, 82.2 and 77.1 per cent., in the majority of cases of simple increased tension it preserves vision, and improves it in some. Iridectomy is not the exclusive, but the chief treatment.

Detachment of the Retina in Nephritis During Pregnancy.

HELBORN, DR. J. From the University Eye clinic of Prof. Von Michel, Berlin. *(Berl. Kl. W.*, 1902, p. 69.) Sudden blindness in the course of gravidity is in rare cases caused by detachment of the retina. Although half a century has elapsed since the invention of the ophthalmoscope, the number of such observations is relatively small. H. gives a review of 21 cases from literature and reports one observed by himself. A primipara, aged 23, became suddenly blind in the eighth month of gravidity, *i. e.*, she saw only motion of hand close to the eyes. In both there was marked albuminuric neuro-retinitis (3 1/2 per cent. albumen in urine) and detachment of the medial and lower portions of retinae, which appeared as solid prominences like tumors and showed no floating. Accouchement forcé delivered an immature dead child on the third day. After ten days' subsidence of neuro-retinitis, complete reattachment of left and almost complete of the right retina. Four weeks later V=1. Visual Fields normal. An examination five months later revealed indistinct outlines of discs and slight changes of pigment, otherwise normal conditions.

In all cases the albuminuric retinitis and detachment of

retina were bilateral, the latter generally occupied the lower segment of globe and occurred suddenly. The most striking feature is the relatively speedy and complete readjustment of the detachment, observed, without exception, in all cases, and the more tardy subsidence of retinitis albuminurica. This is of paramount prognostic value. Although in one case a cure followed in spite of continuation of gravidity, the early delivery of the patients, which becomes imperative by the frequently simultaneous eclampsia, seems to be of great influence for a speedy reattachment. Only in 3 out of 15 reports restitution of normal vision is stated, which is comprehensible from the fact that the failure of sight is due to albuminuric retinitis, not to the detachment (as the visual field shows), and the prognosis with regard to V is worse the longer the period between first occurence of albuminuric retinitis and confinement. H. mentions, that also in albuminuric retinitis, not due to pregnancy, in very rare cases detachment of the retina may supervene at the commencement or, most frequently, shortly before death, sometimes accompanied by hemorrhages into the vitreous, which gives a most unfavorable prognosis. The detachment is apparently caused by subretinal exudation and transudation from the diseased choriocapillaris. The treatment consists in accouchement forcé and, prophylactically, in prevention of renewed conception, at least for a certain time, in women who had albuminuric retinitis, although there are some observations of repeated pregnancy with albuminuria without recurrence of the ocular complications.

History of the Pupillary Reaction on Closure of the Lids.

MEYERHOF, DR., Breslau. (*Berl. kl. W.*, 1902, No. 5, p. 90.) M. shows that the pupillary contraction on forcible closure of lids was not discovered by Westphal, Piltz or others who claim priority, but by Albrecht von Graefe in 1854 and described by him in his Arch. I. 1, p. 318. V. G, explained it as a concomitant motion, which is upheld by M., referring to the anatomy of the posterior longitudinal fascicle of Mendel between root of the VII. and nucleus of the III. nerves. M. repudiates the mechanical explanation of Schanz (see our review in January ANNALS, p. 102) from the following reasons: 1. By pulling the lids from the eyeball in closure of the lids pressure on the root of

the iris can be avoided and the pupillary contraction occurs. 2. The latter cannot be obtained by pressing the fingers on the upper and lower limbus through the lids. 3. It is not proven that such pressure produces obstruction in the blood vessels of the iris. 4. Heine showed by experiments that congestion of the blood vessels of the iris does not cause miosis.

On the New Method of Wingen to Test the Illumination in Schools.

COHN, Prof. H. (*Deutsche Med. W.*, 1902, p. 85.) So far we had four methods to estimate the illumination of school rooms: 1. Cohn's general estimation of light by measuring the length and width of the windows in proportion to the area of floor, height and length of room, etc. 2. The physical method with L. Weber's photo-meter. 3. The stereometric, by measuring the amount of sky-light falling into the room with the "Raumwinkelmesser" of L. Weber. 4. The method of Cohn, in determining how many letters a healthy eye can read at 40 cm. in thirty seconds.

C. considers the new photochemic method of Wingen a great advance. It is not a photochemic photometry, but a very practical test of illumination for orientation. According to Wingen the point was not to know how many meter candles each seat had, but only which seats did not have the illumination of 50 meter candles. It suffices to put aristo-papers on a desk on which an illumination of 5 meter candles has been found with the photometer, and simply to compare with these the other aristo-papers put on other desks. All papers which have become darker, after an hour, than the test paper, show good seats, and all which remain paler, poor ones. The papers are fixed in subsulphurous sodium just as in photography and kept as a lasting "Menetekel" for the management.

Wingen claims the following advantages for his method: 1. It is simple, cheap and brief. 2. It can easily be repeated. 3. It expresses the illumination of all seats of a whole school in the same fifteen minutes and under equal meteorological conditions. 4. It may be executed during school hours, so that the real conditions are found, *i. e.*, the darkening of one scholar's desk by the

shadow of his neighbor's. 5. It furnishes demonstration tables for reference.

Chloroform-death from Paralysis of the Heart.

LAQUEUR, PROF. L., from the eye clinic at Strassburg. (*D. Med. W.* 1902, p. 114.) A boy, aged fourteen, on whom enucleation of the left eye was to be performed, died a few minutes after commencing to inhale chloroform. Artificial respiration, rhythmic tractions of the tongue, massage of heart, hypodermics of ether were without avail. The autopsy showed no heart disease but unusually enlarged thymus, 9 cm. long, 5.50 cm. wide, enlarged faucial and lingual tonsils and spleen (14 cm. long, 8.5 cm. wide, 4.5 cm. thick). This corresponds with the observations of v. Kundrat, who found, as a constant phenomenon, hyperplasia of the thymus, which was also seen in sudden deaths from other causes (in ether narcosis, after injection of diphtheria antitoxin, cold bath). It was never found hyperemic, generally anemic, so that sudden death can not be ascribed to mechanical pressure of the thymus. It must be an indirect cause. Perhaps the enlarged thymus, in its interior secretion, and the other enlarged lymphatic organs produce a substance which acts toxically on the nervous apparatus of the heart. Nothing definite can be said as long as the physiological function of the thymus is in the dark. From a practical view the examination of the thymus is as important as that of the heart before narcosis. Since the differential diagnosis between enlarged thymus and bronchial glands by percussion is very difficult and by Roentgen rays not very promising, we must try and diagnose it indirectly by inspection of the lingual tonsils, since the hyperplasia of the latter almost always accompanies persistence and hyperplasia of the thymus.

Prognosis of Albuminuric Retinitis.

EUTENER, A. (*Inaug. Diss. Giessen*, 1901.) E. reports on 38 cases (22 men, 16 women), of albuminuric retinitis, observed at the eye clinic at Giessen, and controlled as to their future fate.

The conclusions are:

Prognosis of ret. alb. is very unfavorable, as death generally supervenes within one or two years, but not absolutely. Under favorable external conditions, and in

women the prognosis is better. If not existing before pregnancy ret. alb. gravidarum generally gives a favorable prognosis as to restoration of sight and life, it almost entirely depends on treatment, which requires strict individualization as to the institution of premature birth.

A Case of Traumatic Facial Dislocation of the Eyeball.

ROTHENPIELER, DR. KARL. Althofern. *(Beitr. Z.* Aug., Heft 49.) A lacerated wound along the upper orbital margin of all the soft tissues and extensive detachment of the periosteum, rupture of the levator muscle, dislocation of the otherwise intact globe forward, fissure of roof of orbit. It was caused by the handle of a rapidly moving fly wheel of an agricultural machine. Apparently the handle must have struck the forehead in a tangent direction and cut the skin, muscle and periosteum. The thus formed flap was rapidly torn downward in the direction of the force and, as a band stretched over the eyeball from behind forward and attached to it on several points, pulled the eyeball in the same direction. Finding a resistance at the inferior orbital wall, the eyeball moved in the resultant forward over the former and the lower lid. The anterior pole of the globe was 2.5 cm. in front of the plane through the anterior opening of the orbit. The eye and pupil immovable, cornea dull, T + 1. Below the detached periosteum the optic nerve is exposed to an extent of 2 to 3 mm. almost as far as the optic foramen, its course is straight and its sheaths are intact. After the patient regained consciousness she had no visual perception in that eye which was hypesthetic. Periosteum, levator, orbicularis and skin were replaced and sewed, and the eyeball brought back into the orbit by pulling the lower lid downward with sharp hooks, the lid being incarcerated behind the equator. Perfect recovery after a week. V = 6/12, movement of eyeball normal, no ophthalmoscopic changes. The upper lid still swollen, can be raised, and opens the palpebral fissure to 4 mm. Pupillary reaction normal.

On Concentric Zonular Defects of the Visual Field of the Myopic Eye.

WETTENDORFER, DR. F., Bielitz. With 35 figures of the visual fields on 8 plates. *(Ibidem.)* W. examined, at different sittings, repeated over months, the visual fields of 27 eyes of 14 cases, the clinical histories of which

are communicated in detail. Twenty-one showed opthalmoscopically myopia from 6.00 up to the highest degrees, including 6 aphakic eyes operated upon for high myopia. Results: In all eyes with myopia ≥ 6.00 zonesof the visual fields, concentric to the fixation point, of considerably diminished perception of white and red were found, and in quite a percentage of those of M. <6.00. They appear in forms of closed or open rings at different portions of the visual field, either for both colors or for red alone, and range from simple obscurations of the test objects to absolute scotomata, which, however, are always negative. Number, situation, extension or intensity of them are in no relation whatsoever to the degrees of myopia, ophthalmoscopical changes, sex or age. W. explains the concentric zonular defects from the stretching of the ocular tunics in myopia, which damages the light perceiving retinal elements and the strata of the choroid subserving to their nutrition. Retina and choroid adhere tighter to the sclerotic at the entrance of the posterior ciliary arteries in the circuit of the macula of the vortex veins and the optic nerve. Stretching of the ocular tunics will more readily injure the retinal elements or their matrix by tearing at these points on account of less adaptability. Almost all observers of the myopic visual field agree that the peripheral limits generally are concentrically contracted in different degrees. Likewise almost all investigators found that the peripheral border of the visual field of the very high myopic eye, which has been made aphakic, is generally considerably widened. If, as supposed, e. g., by Otto, a crowding together of the separated rods and cones with simultaneous improvement of function, besides physical and psychical causes, is of importance in the explanation of postoperative increase of V, a careful comparison of such observations, as set forth by W., before and after operation, will be a graduation measure of these conditions of the light perceiving retinal elements.

Contribution to the Pathology of Choroidal Sarcoma.

Berl, Dr. V., Vienna. From the eye clinic of Prof. Fuchs. *(Ibidem)* The important feature was the widespread necrosis of the tumor, iris and retina, extensive edema of conjunctiva and orbital tissue with slight exoph-

thalmus. Iris and the portion of the choroid which was not invaded by the tumor covered with inflammatory plastic exudations. Scleritis, optic neuritis were present and new formed tissue lining the excavation of disc. B. considers the tumor as the primary affection. The noxious products of the necrotic tumor exerted an inflammatory action on the tissues, which must have been very violent, since it not only affected the uveal tract, but also the other parts mentioned.

Spontaneous Rupture of the Capsule and Expulsion of the Nucleus of the Lens from the Eye.

Von Hippel, Prof. E., Heidelberg, *(ibidem.)* Patient, aged 45, had chronic glaucoma of both eyes, totally neglected, eyeballs stone hard, deep excavations. R. fingers 2m., L. perception of light uncertain. R. Iridectomy with von Graefe's knife by Prof. Leber. Immediately after the section the aqueous squirted out in a stream, the iris prolapsed, and was cut off. In slightly opening the palpebral fissure a dark cyst-like mass presented, the lens, which was carefully extracted, followed by great quantities of vitreous. Then followed blood and finally the retina teeming with numerous hemorrhages. Termination in phthisis bulbi. Here also, as in former cases described by von H., retrochoroidal hemorrhage in opening a glaucomatous globe with spontaneous exit of lens. v. H. refers to the paper of Meller (reviewed in October Annals, 1901, p.624).

On Diseases of the Orbit.

Fiser, Dr. J., Laibach. From the eye department of the hospital at Laibach, Primarius: Dr. Emil Bock. (*Wiener Med. Woch.* 1901, No. 48.)

In the last ten years 31 cases of the diseases of the orbit out of 7637 eye patients were observed (0.4 per cent.), in the last year 8 out of 600 patients (1.3 per cent), F. reports in detail 18 cases. Injuries: 1. Large piece of wood in the orbit. Removed. Recovery with preserved eyeball. V. 6/12. 2. Hemorrhage into the orbit from being run over by a bicycle, 3. by the fall of a heavy iron hook on the eye; recovery in each. 4. Total ophthalmoplegia with protrusion and atrophy of the optic nerve from a piece of wood flying against the eye. Eight months later abscess of the orbit, probably from foreign body.

Experience shows, that, large hemorrhages into the orbit being rare, not unfrequently the action of a small force causes a hemorrhage at the apex of the orbit, which is so slight, that it cannot be diagnosed from displacement of the globe, etc., but only inferred from the consequent, often serious, damaged function of the optic nerve. Diaphoresis and moist heat proved serviceable. The optic nerve is not very sensitive to stretching, or recovers from it very soon, so that the vision is restored.

Three cases of orbital phlegmon occurred. Their course varies from no or slight disturbance of the general condition to high fever, so that the patient pays more attention to the general malaise than to the eye affection. With regard to the eventual consecutive atrophy of the optic nerve or destruction of the whole globe as well as to vital danger from meningitis it is a grave affection. In all cases, warm applications were very effective. If there is no vital indication it is better not to be in a hurry with operation, as long as the pus cannot be safely located. Caries from tuberculous periostitis and ostitis, generally affects the temporal margin. F. reports, as an exception, caries marginis orbitae inf. sin. in parte nasal. Two cases of ectasia of the ethmoidal bone with protrusion of the globe, of very slow growths so that the optic nerve adapts itself to the stretching with immunity. F. recommends very early operation to establish a communication with the nose.

Two cases of cysts, which were extirpated. The dermoid cysts generally occur in the orbit at the temporal portion of the eye brow region. Those occurring at the nasal portion, which are very rare, are prelacrimal oil cysts, with contents similar to honey or oil. Two cases of sarcoma of the orbit illustrate the intimate connection of the orbit with the surrounding cavaties. Neoplasmata of the orbit start only in the most rare cases from its tissues, but mostly from the eyeball, optic nerve and its sheaths or the adjacent cavaties, foremost of all the nasal cavity, especially if in connection with the lymphatic tissues of the nasopharynx. Finally two cases of sarcoma of the orbit, originating from the choroid, and one of carcinoma of the orbit, arising from the ocular conjunctiva, are described.

Report on Trachoma at the Eye Clinic at Giessen.

SOEBBEKE, A., (*Inaug, Diss.*, 1901.) Out of 20499 patients, treated from April 1, 1895 to January 15, 1901, 5070—24.83 per cent. had conjunctival affections, among which were 359—7.08 per cent. (1.77 per cent of all eye patients) trachoma cases, a decadence from 5.45 per cent. to 1.77 per cent. within the last six years. Those who are exposed to dust in their work are mostly afflicted with trachoma. Middle age predisposes more than the first ten years and higher age. It is prevalent in the male and is chiefly propagated by the laborers from the East and Italy. At present no special expensive preventive measures against trachoma are called for by courses for physicians or compulsory treatment of trachomatous patients.

Contribution to the Knowledge of Episcleritis.

HOERL, W. (*Inaug. Diss. Giessen*, 1900.) Out of 53726 patients of the eye clinic at Giessen within the last two years 134—0.26 per cent. showed episcleritis (statistics from Schoeler's Clinic at Berlin 0.4 per cent). In a great number of the cases the etiology could not be ascertained. The greatest percentage showed lues 5.2 per cent., muscular rheumatism 7.5 per cent., articular rheumatism 3 per cent., gout 0. Farmers and laborers, probably from climatic exposure and insufficient nutrition, were mostly affected. Warm applications, salicylates, diaphoresis, antisyphilitic, hydrotherapeutic treatment, iron preparations, cod liver oil, mineral waters were employed in most cases.

Extraction of a Piece of Iron Which had Wandered from the Vitreous into the Anterior Chamber.

VOSSIUS, PROF. A., Giessen., (*D. Med. W.* 1902, V. B. p. 79.) A piece of iron entered the vitreous of the left eye of a man, aged 44, eight years ago, while repairing a boiler. As the magnet extraction was refused, all stages of siderosis could be observed clinically. About one and a half years after the injury, while the iris had assumed a brown color, and brown spots were observed under the anterior capsule, an opacity of lens commenced and became total after four months. Five years after the accident spontaneous dislocation of the lens, which sank into the vitreous after six months. Pupil very narrow. After three years patient came to the clinic, on account of spon-

taneous, very intense pain in eye and head. Eye very red. On the lower portion of iris the brown piece of iron is seen which had spontaneously passed into the anterior chamber through the pupil. Removal with magnet through section in lower limbus, without accident. The migration of the foreign body was apparently facilitated by the displacement of the lens. Normal recovery after the operation, with + I2 fingers at 1 m.

On Opacities of the Cornea, Caused by Lime and a Method for Clearing Them.

GUILLERY, DR. H., Coeln. (*Arch. f. Augenh.*, XLIV, 1902). From the elaborate monograph of Andreae (reviewed in these ANNALS, April, 1900) we learned that the opacities of the cornea, caused by lime, must be an organic combination, viz., albuminate of calcium, for which we have no solvent. G. found such a solvent in chloride of ammonium, which he employed successfully in 2 to 20 per cent. solutions by means of eyebaths applied for one-half or three-fourths of an hour daily, at first on the eyes of oxen, then on living rabbits whose corneae had been cauterized with hydrate of calcium, and finally on a man with an opacity due to lime of a year's standing. For general use he advises 2 per cent. solutions, which are not irritating. His conclusion is that the solution of albuminate of calcium in the living human eye is possible and thus a new field for ocular therapeutics has been gained.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

CASEY A. WOOD, M. D.,

CHICAGO.

(Quarter Ending March 31, 1902.)

Subconjunctival Injections of Artificial Serum in Certain Diseases of the Eye.

MORGANO, P. (*Annali di Ottalmologia*, XXX, Fasc. 10-11, p. 692.) Morgano has made the following observations in cases treated by him with a solution made according to the formula of Pohel, which, he claims furnishes all the constituents of blood serum. Its composition is as follows:

NaCl	54.14	per cent.
Na_2O	11.02	"
K_2O	4.61	"
CaO	1.38	"
MgO	0.21	"
So_3(?)	2.39	"
P_2O_5(?)	1.74	"
Co_2(?)	17.79	"

Merck prepares these ingredients in the form of compressed tablets, soluble in hot water. A one and one-half per cent. solution in sterile water is the remedy the author prefers for the majority of cases. He reports the following unusally good results:

Case 1. In binocular plastic choroiditis with detachment of the retina of recent origin subconjunctival injections of physiological salt solution produced entire cure in the right eye and marked improvement in the left, in which choroiditis and detached retina were of two months standing. In both eyes improvement showed itself after the second injection by increased central vision and enlargement of the visual field. The patient before treatment had

only quantitative vision in the left eye and could scarcely count fingers at 2 meters with the right. Afterward V = 2/3 in O. D. and V = 1/30 in O. S., with enlarged visual fields. Case 2. Traumatic detachment of the retina; perfect cure after eleven injections, with entire reattachment of the retina. Previous to treatment V = 1/100; afterwards V = 1/4; widening of the visual field. Case 3. Recent, plastic, posterior choroiditis; cure after fourteen injections. Improvement after first injection, with marked increase of vision and visual field. Before treatment the patient could scarcely count fingers at 20 cm.; afterward V = 1/25, with a larger visual field. Case 4. Chronic, serous choroiditis with detached retina, injection produced partial reattachment of retina. Before treatment the patient scarcely distinguished movements of the fingers at 20 cm.; afterward he counted fingers at 4 metres, visual field improved. Case 5. Disseminated choroiditis, with posterior staphyloma and detachment of the retina in both eyes; injections produced a scarcely appreciable change in the right eye, which had been affected for a long time, but brought about a reattachment of the retina and marked improvement of vision in the left eye. This eye, however, had been recently affected. Cases 6 and 7. Two examples of chorio-retinitis: injections produced marked improvement of vision and visual fields and of other pathologic conditions in the ocular fundi. In the first case the visual acuity rose from 1/30 to 1/2; in the second V. increased 1/10 to 1/3; with a corresponding improvement in the extent of the field of vision. Case 8. A case of relapsing irido-cyclitis, in which the treatment by injections resulted, after the first two, in cessation of pain, and the arrest of the inflammatory process, and after this attack had subsided vision was much better than before it came on. Case 9. A case of chronic choroiditis with detachment of retina, in which injections gave fair results. Case 10. Exudative chorio-retinitis, where subconjunctival injections resulted in marked improvement, both of vision and of the visual fields. The alterations in fundus oculi also showed improvement. Case 11. Case of amblyopia from commotio retinæ, with pallor of the optic papilla and signs of retrobulbar perineuritis, which markedly improved after 7 injections. Before treatment the patient could hardly

count fingers at one metre distance; afterward, V = 1/10. Extension of perimetric boundary. Case 12. Infective, plastic, irido-cyclitis. Injections arrested the inflammatory process, produced rapid reabsorption of the cyclitic exudates and to-day the eye has acquired vision of 1/4. Case 13. Old, exudative choroiditis. Injections gave a perfectly surprising result, improving the condition of the eye so that the patient can now count fingers at a metre, while for 22 years he could not distinguish even hand movements. Case 14. . Case of detached retina in the same individual. Injections have given an excellent, but not a perfect result.

These results, says the author, obtained by injections of physiological salt solution beneath the conjunctiva, show their efficiency in different diseases of the internal ocular membranes and encourage us to a continued use of them with greater frequency in ophthalmological practice. In the mean time, how can we explain their action? Morgano believes that their *modus curandi* is complicated, and due partly to the physico-chemical properties of the physiological salt solution. In other words that subjunctival injections of physiological salt solution, instead of producing, like the chloride of sodium, local revulsion (De-Wecker) or an acceleration of the lymphatic current (Heidenhain, Mellinger, Marti, Schiess-Gemuseus, Lodato, Parisotti), act favorably by increasing the alkalinity and the osmotic pressure of the normal intraocular liquids, and produce in the exudates, which have formed in the eye in the pathological conditions just enumerated, histo-biological and chemical changes, that favor absorption. In the experience of the author the alkalinity of the endocular liquids increases after subconjunctival injections of physiological saline solution. This increase can evidently be produced only by the largest quantity of alkaline and inorganic salts that we can cause to circulate in the intraocular fluids. Since it is known that it is chiefly such free mineral substances that determine the amount of osmotic action and the subsequent absorption of abnormal exudates we most readily bring about both ends by the subconjunctival injections of salt. That physiological salt injections under the conjunctiva favor resorption of exudates is easy to prove, not only from these observations

but from those of many experimenters. However, Morgano very sensibly reminds us that whatever be the mechanism of the action of subconjunctival injections in pathologic eyes, it concerns us chiefly to recognize their beneficial effects, and to profit by them. He also calls the attention of the reader to the fact that he did not mar the value of his chemical observations by other medication; if the patient required general care or treatment this was always given after the injections had ceased, or when the patient had already shown evident signs of improvement.

In cases VI, VII, and IX, in which, along with the injections, treatment by mercury and iodides was given, the good results obtained could not be attributed to the specific remedies, because these were energetically used in all of these patients previously and brought about no improvement.

Altogether the author believes he is justified in concluding that (1) subconjunctival injections of physiological salt solution always produce improvement more or less marked in inflammatory processes of the internal membranes of the eye, especially in those of an exudative type. (2) The improvement is rapid; it begins to show itself after 2 or 3 injections, and often after the very first injection, by increase of vision, of the visual field, and clearing of the vitreous. (3) The improvement is inversely proportional to the length of the disease; it is greatest in recent affections. (4) Syphilitic affections of the choroid and retina also receive benefit from these injections, independently of general, specific treatment. (5) In detachment of the retina, injections of physiological salt solution have the same effect as injections of simple chloride of sodium, and, like them, do not guarantee against a recurrence. At the same time they have the advantage of not producing pain, or a noticeable inflammation of the conjunctiva; they may be repeated daily in dose of 1 ccm. for several consecutive days, without producing adhesion of the conjunctiva to the ocular bulb or sclerotic. (6) The preferable solution is one of 1.5 per cent., isotonic with that of the blood; but in cases in which it is desired to produce a more energetic revulsive action, use can be made of a 2 per cent. solution. (7) Always use a freshly

prepared solution. Cocainize the eye and inject the solution at a temperature of 37°–38° C.. allowing it to diffuse itself slowly beneath the conjunctiva, and immediately after apply a hot compress for about an hour. When these directions are carried out the injections are absolutely painless, and the absorption of the injected salt is materially hastened.

Influence of Retinal Irritation Upon the Chemical Reaction of the Central Nervous System.

Lodato. (*Archivio di Ottalmalogia*, Anno. IX, p. 268. 1902. Nota preventiva.) Lodato previously published a paper in the *Archivio* on the changes in the retina itself due to the action of white light, colors, etc. In conjunction with Miceli he now undertakes a somewhat similar investigation.

The researches had reference to the effect of mixed light upon frogs; at the same time they made some experiments upon birds, mammals and noted the influence upon these of monochromatic light. The facts observed are as follows: The methods employed in obtaining their data with a complete report, will be published later. (1) The brains of frogs kept in the dark for at least 24 hours are neutral in the larger number of cases; sometimes they are slightly acid. This slight and inconstant acidity is due to the hemisphere tissues, the optic lobes being always neutral. 2. The brains of frogs exposed to direct or diffused light, after being in the dark 24–28 hours, are always acid: this acidity is manifested more strongly in the optic lobes, than in the hemispheres. In these last named the acidity is sometimes very slight but is more marked than in frogs kept entirely in the dark. 3. The acidification of the nervous centres, noticeable after five minutes exposure to direct light, increases with the duration of that exposure, and reaches its maximum after an hour's time. A longer exposure does not seem to increase the amount of the acidity. 4. The exposure to light of frogs previously made blind by enucleation of the eyes produces a slight acidity, noticeable in the hemispheres, but leaves the optic lobes neutral. From this it may be deduced that the acidification of the optic lobes, in normal frogs exposed to light, is caused exclusively by the excitation of the retina, while in the acidification of the hemispheres other causes intervene.

These results furnish, at the same time, proof by experiment that the function of vision is governed by chemical changes in the nervous system, and that these changes are somewhat tangible—at least in frogs—in that part of the nervous system which has most direct contact with the peripheral organs of vision. In a foot note the authors further explain that other experiments are needed to confirm certain facts observed and to decide whether they are so constant as to indicate an unchangeable law and, if so, to better appreciate all the causes which combine in the production of such results. It is probable that (1) the optic lobes, as well as the hemispheres, of birds (cardinals) kept in the dark for 24 hours are acid, but the degree of acidity is not equal over the whole surface of the hemispheres, the anterior parts being more acid than the posterior. (2) The exposure of cardinals to direct light (one hour)—after remaining 24 hours in darkness—seems not to increase sensibly the degree of acidity of the optic lobes and of the anterior portion of the hemispheres; at the same time it seems to increase decidedly the acidity of the posterior portion of the hemispheres.

The Double Pupil and the Expression of the Eyes.

G. ALBERTOTTI (*Archivio di Ottalmologia*, Anno IX, fasc. 5-6, p. 238) publishes the results of his studies, which ought to be of some interest to ophthalmologists. In 1861 Cavedoni, a distinguished numismaticist and archeologist, in describing an antique bas-relief representing the god Pan in the Museum of Modena, stated that in this sculpture the left eye (the only one seen, because the figure is represented in profile) presented an evident example of double pupil as indicated by two hemispherical holes, accompanied by two semilunar folds. Cavedoni added that such accuracy has not been noticed by others, and mentioned, in further proof of his position, that Pliny speaks of families of sorcerers that had double pupils in one or both eyes. This statement of Cavedoni, probably on account of his reputation, has been accepted even in our own time without discussion, and even in Crespellani's recent catalogue of the Museum of Sculptures at Modena it is said that this bas-relief has in the left eye a double pupil, and that it is believed to represent one of a family of sorcerers. The descriptive letter of Cavedoni and a personal examination

of the bas-relief, however, have convinced Prof. Albertotti that Cavedoni is mistaken. He believes that the two hemispheric folds upon which Cavedoni founded his opinion do not represent a double pupil in an eye, but are simply the artifice used by the sculptor to represent an eye with a single pupil and in the normal state. To prove this Albertotti cites several other examples of a similar method of representing the eye in sculpture, and reminds us that it was employed not only in the imperial epoch, but in the middle ages, and is utilized by artists even at the present day. He then enumerates the methods used by sculptors to represent the various positions of the eyeball and poses of the eye, grouping them in five principal categories, which he illustrates by descriptions, and by photographs of antique sculptures existing in the Vatican Museum and in the Capitoline.

The peculiarity found in the eyes of the god Pan and in other sculptures (such as small excavations, half moons) have nothing to do with expression; they are only expedients of artist-workmen to procure different effects of light and are especially intended to give direction to the glance.

Artificial Maturation of Cataract by Multiple Puncture of the Crystalline Lens.

ALESSANDRO (*Archivio di Ottamologia*, IX, Fasc. 5-6, 1901, 201) reminds us that many methods have been employed to ripen immature cataract but believes that all of them are more or less defective, ineffective or dangerous. He prefers artificial maturation by means of multiple punctures of the anterior surface of the crystalline. The instruments needed are speculum, fixation forceps and a cutting (knife) needle. Use previously atropin, cocain, and ocular disinfection. Incise the cornea at the outer third of the corneal margin, directing the knife a little obliquely. With the needle introdnced into the anterior chamber it is easy to incise the capsule of the lens, making five to ten punctures, and taking care to distribute them over the greater part of the anterior surface. Then withdraw the needle taking care not to empty the anterior chamber. A monocular bandage is now applied which can be removed in two or three days. The corneal incision heals in a few days; maturation goes on very rapidly and completely, to judge from the following cases.

In every instance there were no complications, and only slight, evanescent injection about the corneal margin.

Case 1. C. A., 60 years, nuclear cataract of *left* eye, nucleus sclerotic and opaque, margin very incompletely opaque, artificial coloboma above (operation in April, 1897); attempted maturation by paracentesis and massage over cornea (15 Feb., 1899). Vision = counts fingers at 1.5 metres; with dilatation of pupil by atropin, at 4 metres. Perception of light normal all over visual field. About the same condition is present in the *right* eye.

May 20, 1900. Artificial maturation with multiple puncture of left lens. No operative incident; the anterior chamber not emptied; pupil dilated after the operation; tension normal.

May 21. Slight injection; cornea transparent; pupil dilated and normal; increased opacity of edge of lens; atropin instillation.

May 24. Injection past; no synechiæ; opacity increased.

May 29. Maturation complete; eye is otherwise normal.

June. Extraction of cataract without inconvenience; the cortical substance is semi-fluid. Corneal incision healed slowly, but aseptically; pupillary fields remains black. V = 1/2 with S + 12d ⊃ Cyl + 1.25 axis vertical. Ophthalmoscopic examination; small floating bodies in vitreous. Patient promised to return for operation on other eye.

Case 2. M. F., 61 years, peasant. Right eye pterygium toward internal angle; senile, progressive cataract with nucleus sclerosed and margins slightly opaque; began two years ago. V = fingers at two metres, with dilatation of the pupil by atropin; perception of light normal in all quarters of the visual field. Tension normal. Left eye, mature senile cataract which appeared more than 2 years ago.

May 9. Operation on mature cataract. Patient restless during operation; spasm of lids; did iridectomy to keep iris from prolapsing. Healing progressed rapidly and without accident. After several weeks V = 2/3 with spherical + 12D.

May 22. Artificial maturation right eye.

May 24. Diffused injection; cornea transparent; iris apparently normal; tension normal; cortical substance completely opaque.

June 6. Extraction of matured cataract; cortical substance soft. Operation without a blepharostat on account of spasm of lids; prolapse of iris removed.

June 9. Anterior chamber almost reformed; cornea slightly opaque.

June 14. Cornea transparent, incision healed, anterior chamber reformed; pupillary field in part occupied by opaque capsule. After about 7 weeks patient dismissed; V = 2/3 with spherical + 11D.

Case 3. S. R., 52 years, peasant. O. D. senile cataract with hard nucleus and soft cortical substance. V = fingers at 2 metres; perception of light in all parts of the visual field. O. S. incipent senile cataract; V = 2/3.

June 4. Cortical substance of crystalline lens opaque; Vision not increased by dilation of pupil by atropin: no adhesion to lens; injection gone, T. normal.

June 6. Artificial meturation O. D.

June 7. Slight injection and redness of conjunctiva; cornea transparent; tension normal.

June 10. Hyperemia gone; pupil dilated; pupillary margins not adherent; lens completely opaque. V=fingers at a few centimetres.

June 14. Extraction of cataract without accident; cortex of lens semi-fluid.

June 16. Incision healed; anterior chamber normal.

June 29. Patient dismissed. Vision is "satisfactory." To return for operation on other eye.

Case 4. R. R., 45 years. O. D. normal. O. S. uncomplicated cataract, cortical substance not completely opaque especially in anterior layers. V = fingers at 3 metres without dilatation of pupil.

Sept. 10, 1900. Artificial maturation.

Sept. 12. Slight injection.

Sept. 19. Eye normal; T. normal; vision, perception of light in all segments of the visual field; distinguishes light of a candle at 5 metres.

Oct. 1. Extracted cataract without complications, or iridectomy.

Oct. 3. Incision healed; cornea slightly opaque; anterior chamber reformed; pupil round and central.

Oct. 8. Patient dismissed cured.

May, 1901. Cornea entirely transparent; pupil perfectly round and central. Iris dilates equally with atropin; V = 1 with sph + 10D. ⊃ Cyl + 1D. axis vertical.

These cases show that the operation is simple, efficacious and not dangerous, although, as the author admits, the small number of patients treated does not permit one to come to definite conclusions much less to present the method for critical study or to place it on a par with other and well-tried methods.

The many operations suggested may be placed in two categories. 1. Those which destroy the continuity of the capsule of the lens (Gibson, Graefe, Stellwag). 2. Those which do not injure the capsule (Förster, Rohmer, Denti, Jocqs).

Certainly the method in question has nothing in common with the first class, that comprises various incisions of the anterior surface of the lens. It has equally little in common with those of the second category. Förster's method is simple massage of the lens through the cornea. Rohmer uses massage of the cornea and lids after making 2 or 3 punctures of the lens. Denti suggests a central puncture of the lens, but results show this procedure to be quite as dangerous as the central incision of Gibson. Jocqs pushed a Pravaz knife through the anterior portion of the lens to admit the aqueous humor.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas City, Mo.)

Dr. George Abelsdorf will hereafter reside in Berlin.

Dr. E. Gruening, of New York, has moved to 36 East 57th street.

Dr. Groenouw, of Breslau, has been appointed Professor of Ophthalmology at Rostock.

Dr. Charles H. May, of New York and of these ANNALS, has recovered from his recent illness.

Dr. Albert Rufus Baker, of Cleveland, has moved to 604-5 New England Building, Euclid avenue.

Dr. A. A. Hubbell, of Buffalo, is president of the New York State Medical Association this year.

The International Medical Congress will meet at Madrid and be in session from April 20th till 30th, 1903.

Dr. C. M. Culver, of Albany, is president of the Albany branch of the New York State Medical Association.

Mr. Elmore Brewerton, F. R. C. S., England, has been appointed Assistant Surgeon at the Royal Westminister Ophthalmic Hospital.

At the recently established clinic for eye cases in the Charity Hospital in Berlin Dr. Richard Greeff has been made Executive Surgeon.

At Montreal Dr. R. Boulet, of the Ophthalmic Institute, was recently appointed director of the Eye and ear Department of the Hotel Dieu Hospital.

Dr. Arthur Brinton has received the appointment of Resident Surgical Officer at the Birmingham and Midland Eye Hospital, vice G. M. Scott, M. D., resigned.

Dr. Edwin Wollaston Pyle, first assistant surgeon at the New York Eye and Ear Hospital, died February 7th, at his residence, Jersey City. He was 53 years of age.

A newly created position has been made in the Wills' Eye Hospital, Philadelphia, and Dr. McCluney Radcliffe has been appointed to fill it—that of Executive Medical Officer.

Mr. Alexander, M. B., Ch. B., Edin., has received the appointment of Senior House Surgeon, and Dr. Walter Sykes that of

Junior House Surgeon at the Birmingham and Midland Eye Hospital.

George W. Seip, of Erie, Pa., died February 21st. He was a graduate of Jefferson Medical College in 1862, and prominent as a surgeon in the eastern part of the state, and in later years eminent as a specialist in ear and eye diseases in western Pennsylvania.

An epidemic of "pink eye" in Philadelphia is attributed to the torn-up and dirty condition of the streets. About 3,000 persons are reported to be suffering from the complaint. Of these nearly 500 cases were treated at the Wills' Eye Hospital within a period of ten days.—American Medicine.

Mr. E. Treacher Collins, F. F. C. S., Eng., has been appointed to the newly made post of Ophthalmic Surgeon at the Charing Cross Hospital, and also Lecturer on Ophthalmology at the Medical School. Mr. Collins has also been appointed as Visiting Ophthalmic Surgeon to the Metropolitan Asylum Board of Isolation Schools at Brentwood and Swanley.

Attention is called to the coming meeting of the American Medical Association at Saratoga Springs, June 10th to 13th, 1902: particularly to the Section on Ophthalmology and the General Pathologic Exhibit. It is to be hoped that those ophthalmologists having interesting specimens, drawings, photographs, etc., will contribute to the exhibit.

The Chicago Eye, Ear, Nose and Throat College.—At the annual meeting of this College, held February 10th, the following were named as the board of directors for the ensuing year: President, Dr. W. A. Fisher; Vice-President, Dr. A. G. Wippern; Secretary, Dr. J. R. Hoffman; Members, Drs. Thomas Faith and H. W. Woodruff.—New York Med. Record.

Dr. Anton Padiaur died in Eger, Bohemia, February 9th, aged 39 years. He was well known as a specialist for diseases of the eye, ear and nose. His death was due to blood poisoning. The death is also announced of Dr. Chedevergne, director of the medical school and vice-president of the Conneil of the University of Poitiers, France, chevalier of the Legion of Honor.—Phila. Med. Journal.

Arthur T. Muzzy, an ear and eye specialist of New York, died March 4th, aged 51. He was born in India, the son of a missionary, was graduated from Amherst College in 1874, and from the New York College of Physicians and Surgeons in 1879. He was assistant surgeon at the New York Eye and Ear Infirmary, and consulting physician for the eye and ear at Gabella Heimath Home.—American Medicine.

Dr. Alvin A. Hubbel, of Buffalo, has accepted a reappointment as ophthalmologist to the Buffalo Hospital of Sisters of Charity, a position from which he resigned in 1898, after a service of fifteen years, in consequence of radical changes in management, to which

none of the staff was willing to submit. The original system has been restored, however, and many of the old staff have returned to service.—Ophthalmic Record.

Wills' Eye Hospital, Philadelphia.—According to the report of the Board of City Trusts, the equipment of this hospital is described as antiquated, its buildings dingy and out of repair, and new buildings unfinished. It is said that the income from the Wills' estate is not sufficient for the running expenses. The sum of about $5,000 is required to place the hospital in proper condition at the present time.—New York Med. Record.

Birthday Celebration.—Dr. Herman Knapp, the distinguished ophthalmologist of the College of Physicians and Surgeons of New York, celebrated his seventieth birthday recently. At his suggestion the New York Ophthalmic and Aural Institute, of which he was the founder, is to be removed and equipped after modern methods. The trustees have already subscribed $100,000 for this purpose, and about $400,000 more are needed to build the new institute.—American Medicine.

Dr. Jeremiah T. Eskridge, the famous neurologist who died at Denver, Colo., Jan. 16th, 1902, has been a worker in ophthalmology. He served on the Committee of the Philadelphia County Medical Society, of which Dr. Risley was Chairman, which examined the eyes of children in the Philadelphia public schools. After removal to Colorado he practiced ophthalmology at Colorado Springs prior to his settling in Denver. He was an expert ophthalmologist, and fully appreciated the importance of eye-strain.—Ophthalmic Record.

Dr. Oren Day Pomeroy of this city, the well-known eye and ear specialist, died March 20, of apoplexy, at Whitestone, L. I. He was sixty-eight years old. He was the author of several standard works on his specialty; was surgeon to the Manhattan Eye and Ear Hospital; ophthalmic and aural surgeon to the New York Infant Asylum, and consulting surgeon to the Patterson (N. J.) Eye and Ear Infirmary. He gave up active practice several years ago on account of failing health.—New York Med. Record.

The Prevalence of Blindness.—There are about 1,000,000 people blind in the world, says a statistician. The largest proportion is found in Russia, for there, nearly 200,000 people walk in literal darkness. The chief cause is ophthalmia, due to bad ventilation of the huts of the peasantry and the inadequate facilities for treatment. The sands of Egypt are responsible for a good deal of blindness in the Khedive's land. Amongst the world's inhabitants the known proportion is something like one blind person in every 1500.—Health.

Detroit Ophthalmological and Otological Club.—A new medical society was instituted March 18th at the Hotel Cadillac whose purposes are to promote the interests of science and good fellowship among its members. It bears as its name the Detroit Ophthalmological and Otological Club. It is proposed to limit the membership

to members of the State Medical Society and any of the recognized local societies. Meetings will be held the first Tuesday of each month. The chairman each night will name the chairman for the ensuing meeting. Dr. Walter R. Parker has been elected secretary. The charter members of the society are: Drs. Eugene Smith, Leartus Connor, Don M. Campbell, L. E. Maire, A. Thuner, R. W. Gillman, George E. Frothingham, G. L. Renaud and Walter R. Parker.

American Medicine, the latest entry into the ranks of weekly, medical journals of the country, has, since the new year, adopted two distinct features that should commend it most highly to the earnest and ethical members of the profession. The first of these is the establishment of departments devoted to the special branches of the practice of medicine, each of which is placed under the charge of men recognized as leaders. We note among these departments that of Ophthalmology, under the charge of Dr. Walter L. Pyle; of Laryngology, Otology, and Rhinology, under the charge of Dr. D. Braden Kyle; of Orthopedic Surgery, under the charge of Dr. H. Augustus Wilson; of Nervous and Mental Disease, under the special charge of Dr. John K. Mitchell, aided by Dr. F. Savary Pearce; of Dermatology, under the charge of Dr. M. B. Hartzell. The foregoing appear at regular intervals, keeping track of the literature in each specialty as it appears. The departments of Clinical Medicine, General Surgery, Obstetrics and Gynecology, and Treatment, appear in each issue of the Journal and are overlooked by Dr. Solomon Solis Cohen, Dr. Wilmer Krusen, Dr. Martin B. Tinker, Dr. David Riesman, and Dr. A. O. J. Kelly. Under the heads of the departments are published weekly editorials relating to practice in these departments, summing up all recent thought, and placing the socalled scientific editorials in its proper position, and leaving the leading editorial pages free to an eye view of the week in medicine, analagous to the highly esteemed department, "The Month," so popular in the London Practitioner. The second great departure was that limiting the number of advertising pages. This was entirely in the line of the professional ideals actuating the founders of the Journal, and so inaugurated with the second years' existence of the journal. As the subscription list of the journal increases, making the income from that source greater, it is intended that the number of pages of advertising shall be still more decreased, and more pages devoted to scientific matter. The managers believe that this plan recognizes in the most practical way their obligations to professionalism, to the general profession, and our individual subscribers. It is also as thoroughly to the benefit of the better class of advertisers, who will thus gain the added prominence of exhibition conferred by the fewer pages, and the benefit of the selection implied in the limitation.

A New Local Anesthetic.—The Lancet in a recent number writes of a new local anesthetic procured from a plant named "gasu-basu" a native of India, the active principle of which is an alkaloid. The

English journals says the experiments were made with a salt obtained by treating the alkaloid with hydrochloric acid. The salt has been named nervocidin. In weak solutions it produced a marked local anesthesia of the cornea of warmblooded animals. Two drops of 1-20 per cent. solution applied to the human conjunctiva produced a burning sensation, accompanied by lacrimation, followed, after twenty minutes, by anesthesia of the cornea, lasting for five hours. After seven hours the cornea regained its normal condition, A 1-10 per cent. solution of nervocidin brushed over the mucous membrane of the cheek caused local anesthesia of the brushed surface, and of the tongue, accompanied by loss of the sensation of taste and the perception of touch, but without loss of the perception of heat and cold. Subcutaneous injections of the drug have not, as yet, been successful in producing local anesthesia in animals. The general action of nervocidin on the system was that of a toxic which, by paralyzing the motor centers of the nervous system and of the peripheric nerves, caused death. All the experiments up to the present undertaken proved that nervocidin was a powerful local anesthetic possessing a great advantage over cocain, in that it produced a much more sustained action, for the effect of a 1-2 or 1-5 per cent. solution might last for two or three days. The new anesthetic, however, has its drawbacks, such as the local irritation to which it gives rise, the slow production of a state of anesthesia (from ten to twenty minutes being required), and a liability to cause nausea, vomiting, salivation, and other symptoms of general poisoning.

A local anesthetic, whose properties last for such a length of time as that described above, might be of the utmost value to surgeons, and especially to ophthalmologists. There can be no doubt that more will be heard of nervocidin, when it will be easier to pass a competent judgment upon it.—New York Med. Record.

Library for the Blind.—A circulating library for the blind is one of the most unique departments of the Perkins Institute, in South Boston. This library has 12,821 volumes, and they are sent all over the country. About five hundred books are taken out annually by the adult blind in Massachusetts and about one hundred more by blind persons outside of the state. These books, with their raised letters, are very large. The Bible, which is most read among the blind, takes twenty-five volumes, which means a cost of $5 or more. Novels are seldom put in the embossed type for the sightless, as this kind of printing is very expensive, and great care must be exercised in selection. Only standard classical works in fiction are prepared for the blind, who are usually great readers of history and biography.—Philadelphia Med. Journal.

Epidemic Conjunctivitis Due to the Koch-Week's Bacillus.—C. Markus reports the study of 150 cases of this disease during the recent epidemic among children at Bittersfeld. Usually the first sighn of the trouble is the appearance of a moderately abundant, yellowish-white secretion upon the conjunctiva of both lids.

At this time there is a little or no congestion, but the upper lid is somewhat infiltrated. The secretion rapidly increases in amount and becomes decidedly purulent in character. Conjunctival congestion appears and rapidly increases in severity, both the palpebral and ocular conjunctivæ being affected. Both upper and lower lids become markedly edematous. Subconjunctival hemorrhages are often present. A creamy purulent secretion is never present, and its absence forms the chief differential clinical sign between this disease and ordinary blenorrheal conjunctivitis. Chemosis and membranous formations are also occasionally seen. This particular epidemic was characterized by the appearance of marginal phlyctenules early in the disease. These were usually multiple and not dependent upon the presence of a scrofulous diathesis. In most instances the disease ran an acute course as above depicted. A very few were observed in which the process was subacute from the onset, but a considerable number of cases were seen in which the course was chronic throughout. In the majority of instances the disease lasts from three to four weeks. Exceptionally it can be cured in from eight to fourteen days. Very often the acute cases subsequently become chronic and in this condition acute exacerbations are frequent. The specific bacillus is present in the secretion generally in great numbers. It may be present in pure culture or associated with various other bacteria, especially pneumococci. In cover-glass preparations it may be readily stained with dilute carbol-fuchsin. It does not retain Gram's stain. The acute cases with abundant secretion are best treated by applications of a 2-per-cent.-nitrate-of-silver solution followed by irrigation with saline solution. The phlyctenules easily succumb to applications of yellow-oxide-of-mercury ointment. In chronic cases the lids should be touched with 1½-per cent. solution.—Münchener Medinische Wochenschrift and New York Medical Record.

The Indiscriminate Use of Atropin in Eye Diseases.—H. Carter Mactier warns all medical men to use atropin with the greatest care, and in all patients over thirty years old—the predisposition to glaucoma increasing with age—to use it only in case of necessity, and then only if the patient can be kept under constant observation. He gives the differential points between acute glaucoma and iritis. In the former the pupil is larger than usual, and does not react to light. In iritis it is smaller than usual and also fixed. Ophthalmoscopic examination of acute glaucoma shows the media to be hazy, and there will be a grayish-green reflex. In iritis there are small exudations in the media, and the pupil's irregularity is due to these binding the iris to the lens. In acute glaucoma the tension will be found increased. In iritis it is normal. In acute glaucoma the loss of vision is out of all proportion to the turbidity of the media, and is greatest on the nasal side. In iritis it is often not diminished except by photobia. In glaucoma the cornea is generally almost insensitive to touch, while in the iritis it is hypersensitive. The presence of vomiting with an inflamed eye is almost diagnostic of glaucoma, though it may occur in iritis. Confirmatory

symptoms should always be sought in such cases.—British Med. Journal and New York Med. Record.

College of Physicians, Philadelphia, Section on Ophthalmology, Meeting January 21, 1902, Dr. William Thomson Chairman.—Dr. Geo. C. Harlan showed a case of congenital orbital cyst with microphthalmus in a girl of seven. The left lower lid was pressed forward by a large incompressible, but tensely fluctuating bluish cyst. The tumor measured 40 by 25 mm. The lower margin of the orbit was 5 mm. below that of the other side. The interpalpebral commissure was 5 mm. shorter than that of the other side, was pushed upward, and opened into a deep conjunctival sac above the cyst. At the bottom of this sac could be felt a rudimentary eyeball, hardly larger than a pea, moving freely with the other eye. Congenital orbital cysts with microphthalmus or anophthalmus are rare. A few cases have been recorded in England, France, and Germany, and but one in this country, by Dr. Harlan in 1893. Their pathology is very obscure, but they are probably formed by embryonic elements intended for the development of the eye.

Dr. C. W. Le Fevre reported a case of bullet wound of the orbit in a man aged 47. The wound was in the right temple midway on a line from the angle of the orbit to the top of the attachment of the auricle. Except for immediate complete blindness, there were no symptoms. Six weeks after the healing of the wound, panophthalmitis with sympathetic irritation occurred, the latter disappearing after the enucleation. A study of the bulb showed that a fragment of bone 9 mm. long, 5 mm. wide, and $2^1/_2$ mm. thick had been driven from the orbital plate into the eyeball. Dr. Risley recalled a similar case which he had reported to the section two years ago.

Dr. G. E. de Schweinitz read a paper on the treatment of detachment of the retina by scleral puncture, followed by large subconjunctival injections of salt solutions. After referring to the literature of the subject, he gave the history of a case of retinal detachment completely cured by nine large (25 min.) subconjunctival injections of salt solution followed by scleral puncture. Vision before treatment was hand movements; after reattachment with—4 D, it was 5/25. Prior to this treatment, dorsal decubitus, pilocarpin diaphoresis, and iodid of potassium had proven ineffectual. Dr. de Schweinitz referred to the solutions which had been used by French observers. He also stated that many of these reattachments of the retina were not permanent. Dr. Risley had cured a case by the subconjunctival injection of salt solution in smaller quantities, but the detachment recurred.

Dr. William Thomson showed a boy, aged 19, with normal vision after the removal of of a piece of steel from the vitreous by the Sweet magnet. The metal extended in front of the attachment of the external rectus, and could be seen with the ophthalmoscope in the outer upper portion of the vitreous. As the lens was uninjured, the wound in the conjunctiva was opened with a spud, and the cone-shaped point of the magnet placed against the sclera, then the current was turned on; the boy was conscious of the movement

of the steel. A slight incision was then made in the sclera, the magnet again applied, and the steel was found attached. Three weeks after operation V = 6/6, with a slight scotoma corresponding to a area of choroidal degeneration where the steel rested. The formation of an opaque exudate without infection is rarely seen and watched during absorption.

Dr. E. A. Shumway reported a number of cases of acute contagious conjunctivitis of a severe type, characterized by pronounced swelling and the formation of phlyctenules. The Koch-Week's bacillus was found in all cases examined. This differed from the reports of Veasey and de Schweinitz, who found the pneumococcus the most frequent cause of acute conjunctivitis. Dr. J. F. ren dergast described the epidemic of conjunctivitis which prevailed among 450 children in St. John's Orphan Asylum during 1900-1901. It was found impossible properly to isolate them, and 300 cases occurred during a period of six months, some of the boys being infected a second time. In about 20 cases phlyctenules developed. The epidemic was caused by Koch-Week's bacillus—Philadelphia Med. Journal.

Examination of Ocular Fundi of Animals.—One of the mos remarkable scientific investigations of modern times is now being brought by Dr. Lindsay Johnson, F. R. C. S., to the close of its earlier stages. Some years ago he began to examine the fundi of animals and betook himself to Jamrach's collection of animals and other menageries and found the macula lutea present in monkeys, but that it varied with each genus. Following up his clew, he discovered that every family of the mammalian order possessed a distinct appearance of its own in the eye, by which anyone seeing the fundus with an ophthalmoscope would be able to recognize not only the family but the genus of the animal. He then proceeded systematically to examine all the animals to be seen in the Zoological Gardens of London, Amsterdam, Antwerp, Hamburg and elsewhere; and as a result of this gigantic labor he found many new and striking facts. For instance, he realized that certain organs, such as the pecten, were also to be found in a large number of the lower mammals—rodents and marsupials. This of itself, was an interesting piece of evidence in support of the Darwinian doctrine of evolution. His various discoveries are to be found recorded in the proceedings of the Royal Society. His method of investigation is interesting. To examine the eyes of animals it was necessary for Dr. Johnson to darken the cage, to sit beside the animal with a lamp behind his head and to look through the ophthalmoscope at a distance of half an inch from the animal's eye, for a period of not less than two hours at a time. The total time spent over each animal would vary from eight to sixteen hours. He examined the eyes of about a thousand animals, and made drawings of about 250, some fifty of which have so far been published by the Royal Society. In the cases of the larger animals it was necessary to confine their movements. Thus the elephant was chained down. Sacks some eight feet long were made for slipping over the bears. The closed ends of the

sacks were next slit with a knife and as Bruin protruded his head he was promptly muzzled and lifted on the table for the eye testing. In the cases of lions, leopards, tigers and large cats, muzzles could not be used as they frightened the animals nearly to death. He found it advisable to cut off the whiskers of the brutes, as the touching of the whiskers during the examination made them snap. Some of the birds were induced to thrust their bills into large corks. and the fishes had to be treated gingerly to avoid their suffocation. The boa constrictors and pythons were thrown into sacks, to circumvent their squeezing propensities, and their heads were held out of the sacks by keepers; while with wolves, beavers, otters, seals and sea lions, nets were thrown over them and they were twisted in the meshes.—Ophthalmic Record.

Program of the Western Ophthalmologic and Oto-Laryngologic Association, meeting in Chicago, Ill., at Auditorium Hotel, April 10-12, 1902.

President's Address, Christian R. Holmes.

Hay Fever; Present Status, Pathology, Complications and Treatment, J. S. Mott.

Why Eye Symptoms are of Value in the Localization of Brain Diseases? C. Barck.

Thiosinamine and Electrolysis in the Treatment of Tubal Obstruction, J. C. Beck.

The Use of Electrolysis in the Eustachian Tubes, N. H. Pierce.

Address on Otology: "Relations of the Facial Nerve to the Tympanum, Especially in Tympanic Exenteration" (Lantern Lecture), B. Alex. Randall, Philadelphia (by invitation).

Symposium: Otorrhea.

a The Neighboring Parts to the Middle Ear and Their Inffection, Otto J. Stein.

b The Diagnosis of Meningitis, Phlebitis and Cerebral Abscess Following Soppuration of the Middle Ear, C. Barck.

c When Should One Operate for the Cure of Chronic Suppurative Otitis Media, O. Joachim.

d Principles and Indications for Treatment, Wm. L. Ballenger.

Discussion opened by Norval H. Pierce and Geo. F. Keiper.

Paralysis of the Vocal Cords in Acute and Congenital Diseases, T. V. Fitzpatrick.

Post-operative Management of Intra-nasal Surgery, M. A. Goldstein.

Exhibition of Cases.

The Dynamics of Nasal Disease in Relation to the Maxillæ, G. V. I. Brown.

The Best Means of Removing Turbinal Obstructions, J. W. Murphy.

The Hypertrophied Faucial Tonsils: with a Report of the Morbid Histology of the so-called Submerged Tonsil, E. O. Sisson.

The Significance of Aphonia in the Diagnosis of Aneurism of the Arch, Wm. Porter.

A New Field-of-Hearing Chart, Derrick T. Vail.

Sources of Error in Function Tests of the Ear, A. H. Andrews.

The Lymphatics of the Neck, J. Holinger.

Exhibition of Cases.

Address on Ophthalmology: "The Use of Glasses," F. C. Hotz, Chicago (by invitation).

Exsection of the Rectus for Paralytic Over-correction on the Opposing Muscle, A. E. Prince.

The Present State of Our Knowledge Concerning so-called Partial or Graduated Tenotomies and the Hetrophorias, J. E. Colburn.

Genuine Sympathetic Ophthalmia with Complete Recovery of Both Eyes, Derrick T. Vail.

Epithelial Intra-ocular Tumors, A. Alt.

Refraction; its Difficulties and How to Overcome Them, C. L. Minor.

Exhibition of Cases.

Toxic Amblyopia, D. S. Reynolds.

Pallor of Temporal Segment or Papiloma-macular Bundle of Optic Nerve Fibres Due to Other Causes than Tobacco and Alcohol, J. O. Stillson.

Is the Dislocation of the Lens into the Vitreous Ever Justifiable? Geo. F. Suker.

Clinical Reports, C. D. Wescott.

Transient Astigmatism, C. A. Griffin.

Therapeutic Measures for Promoting Absorption of Exudates within the Eyeball, Randolph Brunson.

Exhibition of Cases.

The Economic Value of Sight, H. V. Würdemann.

A Case of Rapidly Fatal Carcinoma of the Epipharnyx, H. W. Loeb.

Pneumatic Massage in Aural Practice, Edwin Pynchon.

Acute Sinusitis, J. A. Stucky.

Ocular Affections Secondary to Syphilis, Randolph Brunson.

A new feature was a most interesting pathologic exhibit to which many members contributed. The exhibit of surgical instruments and appliances was extensive.

Albert C. Corr, M. D., Chicago Medical College, 1868, one of the best known practitioners of Central Illinois, formerly president of the State Board of health, and president of the Illinois State Medical Society in 1896, died at his home in Carlinville, April 2, after a short illness, aged 63. He was a member of the American Medical Association, and at the time of his death was in editoral charge of the eye and ear department of the Journal of the Southern Illinois Medical Society. The following are the resolutions of respect adopted by the Macoupin County Medical Society at the A. C. Corr memorial held in Carlinville, April 4.

Whereas, In obedience to Nature's fixed and unalterable law of life and death, we must part from A. C. Corr, the Nestor of our society, a charter member and one of its constant supporters, more than

twenty-five years its secretary, Resolved, That we mourn his loss as a brother physician, cut down while in active work for the cause of science and humanity. Resolved, That we escort him to his last resting place, to await the coming of the Great Physician, whose touch healeth all sorrow and pain. Resolved, That a suitable floral emblem be placed upon his bier, as a public testimonial of our appreciation of his beautiful character as a friend, counsellor and Christian gentleman. Resolved, That a copy of these resolution be made of record and a copy be sent to the bereaved wife and partner. Resolved, That a copy be sent to the city papers and to the state and national medical journals.

BOOK NOTICES.

Ophthalmic Myology.

Savage, G. C., Nashville. (Prof. of Ophthalmology in the Medical Department of Vanderbilt University, Author of "New Truths in Ophthalmology," Ex-President of the Nashville Academy of Medicine, Ex-President of the Tennessee State Medical Society. A Systemic Treatise on the Ocular Muscles; Sixty-one Illustrative Cuts and Six Plates. Published by the Author, 139 N. Spruce St., Nashville, Tenn. 589 pp. Price $4.00.)

The author's many valuable essays upon the ocular motor apparatus have been followed by this most important monograph. In this he devotes considerable space to the physical work of the ocular muscles. The reviewer is inclined to agree with Savage upon the fundamental principles as set forth by him in regard the rotation of the eyes and the specific action of the extrinsic ocular muscles. He claims that the axis of rotation always lies well within the equatorial plane of the eye, which is in opposition to the reality of Listing's plane, which has an imaginary vertical plane passing through the centers of the eyes which have been supposed to always contain their axes of rotation in whatever direction they are turned. Savage claims that when the line of fixation passes from its primary to another position, the angle of torsion of the eye in the second position is the same as if the eye had arrived at this second position by turning first about the vertical axis and then about the horizontal axis. This means that the eye would preserve the same relative position. He also contradicts Helmholtz' law of direction and thinks that the intersecting point for the center of the retinal curvature and the center of rotation of the eye coincide. He properly demands that the extrinsic ocular muscles be studied with the fixed median and horizontal planes of the head and states that the ocular muscle movements are not simple but very complex. The recti muscles control the visual axes; the superior and inferior recti keeping them always in the same plane, the internal and external recti making them intersect at the point of fixation, the obliques keeping the vertical axes paralled with each other and with the median plane of the head.

The author's study of the foregoing has been very extensive and the result of his enthusiastic efforts has been a marked advance for ophthalmic science. He has successfully combatted and overthrown opposition to his theories regarding the several and combined actions of the ocular muscles and I think it will be hard to contravert his fundamental principles based upon experimentation in ocular-muscle dynamics. It is otherwise, however, with some of his conclusions, particularly as regards to the effects of heterophoria upon working ability of the eyes and as regards both surgical and non-surgical methods for their relief.

The reviewer, for instance, cannot convince himself that minute deviations of muscular balance have any deleterious effect upon either the motility of the eyes, the exercise of binocular vision or that symptoms worthy of attention may be produced by them. Savage's rule of procedure in heterophoria is to so adjust the relations of the recti and obliques that they can obey the muscle laws above given without nervous tension. His claims, that the muscle balance should be made by a monocular phorometer in which one eye preserves the primary position and that the Maddox rod is unreliable, may be certainly upheld; the false image should be made to appear before either eye and always brought out of the field of binocular fusion. His method for development of the strength of the ocular muscles, i. e., rhythmic exercise with low grade prisms, is scientific and practical, but this method does not develop the faculty of fusion or the stimulus toward convergence as thoroughly and as quickly as does exercise with strong prisms, which he condemns. Other forms of exercise described are simple and effective and are generally accepted. "Exercise should never be done to fatigue. In cases where the recti muscles are weak because of the state of the general health, no treatment should be thought of except that of the well-being of the whole system; use of the eyes should be prohibited."

As regards the operative treatment of heterophoria, the author totally condemns complete tenotomy and recommends partial tenotomies, advancements and shortenings. By "partial" tenotomy he means that some of the fibers of the tendon should be left uncut; the uncut fibers to act as stay-cords to prevent too much retraction of the cut fibers. He states:

1. The aim of every operation should be to give the conjugate brain centers easy control of the ocular muscles.

2. Two things must be kept in view when operating, viz., altering tension and changing plane of action. If the former only is indicated, a central partial tenotomy for lessening tension, and a straight-forward shortening or advancement, for increasing tension should be done. The only indication for changing the muscle plane is cyclophoria or cyclotropia.

3. No operation for lessening the tension of a muscle should ever reduce its verting and ducting power below the normal for that muscle.

4. Complete tenotomies should never be done for the reason that there is always danger of so crippling the muscle as to bring both of the verting powers and the duction power below the normal—the danger of converting one error into its opposite: that is, an exophoria into an esophoria, etc. Not even in squint should a complete tenotomy be done.

My observation as well as those of who are more radically opposed to the applied theories of Savage and Stevens, et. al., and who have learned by bitter experience, leads me to think that the majority of ophthalmic surgeons will never be able to do such exact work as described by Savage. I am inclined to agree with

Landolt's expression that "*nature does the adjustment.*" My experience as regards operative interference in heterophoria is that while we may be able to temporarily adjust the optic axes, yet the progress of time subsequently shows either return of the old error or the development of some other form of heterophoria. The facts that the co-ordination of the ocular muscles is accomplished by variable and complex nerve impulses and is controlled by a complex action of the cerebral centers rather than by the nuclei of the motor nerves or the insertion of the muscle tendons, and that this co-ordination does not occur until a considerable time after birth when the fusion faculty is developed, lead me to consider the restoration of the co-ordinating powers an impossibility in many cases. In dividing simply the central or lateral fibers of the tendon I have personally seen little or no effect.

If we were dealing only with an inanimate object, a machine built upon the principle of the eyeball moved by a measurable impulse, we could exactly figure upon the effect of certain partial or complete deviations or setting forwards of the parts corresponding to the ocular muscles!

The chapter on cyclophoria should be read and carefully studied by all ophthalmologists, but I am sure that it is of much less common occurrence than the author states. In the examination of approximately 6000 cases in which the ocular balance and the strength of the ocular muscles have been recorded, the reviewer has rarely found a case of cyclophoria and seldom looks for this condition unless in the case of oblique astigmatism and where correcting lenses have not given satisfaction. In exercise by cylinders according to Savage, he has not seen any result except as adaption took place which occurs in almost all other cases. This is ascribed by Savage to a compensating cyclophoria. The author gives but little thought to the faculties of fusion and adaption. He handles his subject almost entirely from the distal end.

There are some who think that so-called compensating cyclophoria and cyclotropia are accomplished entirely in the brain and not by the action of the oblique muscles (see article of Verhoeff in this issue). The truth may lie in both directions.

The reviewer would point to the very large number of cases in which heterophoria of a considerable degree exists that is not at all detrimental to easy binocular vision which may be seen in the practice of every ophthalmologist. The faculty of adaption is no doubt responsible for the want of symptoms in such cases.

The book might well be enlarged upon the subject of paralysis and paresis of the ocular muscles. I cannot conceive of the reason for treatment of patients with large pupils by development of their pupil contractors by exercise, as there are no symptoms in such cases except where paralysis of the pupil is produced by mydriatics or disease. The theoretical development of Mueller's and Bowman's muscles by exercise with concave lenses and the prevention of or rather the hindering of presbyopia, is, to me, inconceivable; for presbyopia is not due to a weakened condition of the mus-

cles of accommodation but rather to sclerosis of the lens; in hypermetropic eyes, whose ciliary muscles are notoriously enlarged and necessarily stronger than in myopia or emmetropia, it is generally found at an early age.

Savage claims an exact relation of 1 D. of ciliary impulse to 1.8 (of arc or 3.6° prisms) of convergence impulse. Perhaps this may be so but I do not think that "pseudo" exophoria depends upon such a law.

I have failed to find in this book any detailed mention of the orthoptic treatment of squint and heterophoria by means of stereoscopic exercises.

While he has learned a great deal by the study of Dr. Savage's book and by reading his preceding essays, the reviewer cannot bring himself to adapt the author's theories enthusiastically or *in toto* to his practice. Be this as it may, many of the author's conclusions are extremely practical and as his teaching is a great advance for ophthalmic myology, many of his methods are acceptable in the ophthalmic world. The book deserves careful study by every ophthalmologist.

H. V. WURDEMANN.

The Eye, Ear. Nose and Throat Book.

Practical Medicine Series of Year Books, Comprising Ten Volumes on the Year's Progress in Medicine and Surgery, issued monthly Under the General Editorial Charge of Gustavus P. Head, M. D., Prof. of Laryngology and Rhinology, Chicago Post-Graduate School. Vol. III, Edited by Casey A. Wood, C. M., M. D., Albert H. Andrews, M. D., T. Melville Hardie, A. M., M. D., Chicago. The Year Book Publishers, 40 Dearborn St.

The ophthalmic portion of the volume furnishes abstract selection from the recent additions to our knowledge of medicine and surgery in so far as they are related to the eye and its diseases for the past 18 months. These are efficiently abstracted by Dr. Casey A. Wood in 130 pp.

The same may be said of the 99 pp. devoted to the ear edited by Albert H. Andrews, and of the nose and throat in 103 pp. by T. Melville Hardie. A complete index terminates the book.

The publication of the Practical Medicine Series in this form makes it most acceptable to specialists, who do not care to subscribe for a large book or a number of volumes dealing with other specialties in which they are not so much interested. The book is well bound in cloth and printed in dudecimo.

H. V. WURDEMANN.

Transactions of the Section on Ophthalmology of the American Medical Association.

Transactions of the Section on Ophthalmology of the American Medical Association at the 52d Annual Meeting, held at St. Paul, Minn., June 4–7, 1901. American Medical Association Press, Chicago, 1902.

The transactions of the ophthalmic section of the American Med-

ical Association for 1901 appear in a fine octavo volume of 332 pp., including index, bound in cloth, which does credit to the American Medical Association Press. The book contains the names of the officers and executive committees for 1900-1901 and 1901-1902 and a list of the gentlemen who have served in office since the section was organized in 1879; then come the papers in the order they were read, followed by an abstract of the minutes. The following are the titles and their authors:

Address of Chairman, J. A. Lippincott.

The Treatment of Strabismus Other than Operative, Edward Jackson.

The Strabismus Operation, C. F. Clark.

Strabismus: Its Treatment, A. Edward Davis.

The Cosmetic and Visual Results in Squint, J. Morrison Ray.

The History of the Invention and of the Development of the Microscope, Harry Friedenwald.

Hermann von Helmholtz—The Inventor of the Ophthalmoscope, C. A. Wood.

Tarsadenitis Meibomica, M. F. Weymann.

Total Retroflexion of the Iris, Alvin A. Hubbell.

The Non-Surgical Treatment of Heterophoria, George M. Gould.

The Operative Treatment of Heterophoria, G. C. Savage.

A Table of Ocular Extrinsic Paralyses, Horace M. Starkey.

The Extraction of Cataract without Iridectomy, S. D. Risley.

Temporary Clearing of a Cataractous Lens, Hiram Woods, Jr.

The Economic Limitations of the Visual Acuity in Various Trades and Professions, H. V. Würdemann.

What Amount of Visual Defect Should Disqualify in Railroad Service, Frank Allport.

Mules' Operation, Frank C. Todd.

Late Implanting of Glass Ball in Orbit and Epithelial Lip Grafts Transplanted to Orbit, A. T. Mitchell.

The Newer Pathology of the Retina, with Special Reference to the Changes Produced in the Ganglion Cells by Certain Toxic Agents, Harry Friedenwald. Atrophy of the Retina, Dudley S. Reynolds.

A Case of Blindness from Drinking Bay Rum, Compared with Reported Cases Due to Methyl Alcohol and to Essence of Jamaica Ginger, etc., H. Moulton. Complete Recovery from Double Neuro-Retinitis, C. A. Veasey.

The Value of Excision of the Superior Cervical Sympathetic Ganglion in Glaucoma, George F. Suker.

Herpes Zoster Ophthalmicus, with Brief Report of Five Cases, Wm. C. Bane.

Corneal Lesions in Acquired Syphilis, William H. Wilder.

Lachrymal Stenosis in Infants and Its Treatment, Dunbar Roy.

Metamorphopsia Varians, William H. Dudley.

Injuries of the Chorioid, with Report of a Case, Ellet O. Sisson.

NELSON M. BLACK.

Anomalies and Diseases of the Eye.

Tiffany, Flavel B., A. M., M. D. Professor of Ophthalmology and Otology in the University Medical College of Kansas City, Mo.; Oculist and Aurist to the University Hospital; Oculist to the "Katy" R. R. Co.; Oculist to the Geo. H. Nettleton Home, etc. Hudson-Kimberly Publishing Co., Kansas City, Mo. 1902.

The author says in his preface that the book was written with a view to meeting the "needs of the general practitioner, the undergraduate of medicine, the optician and the beginner in ophthalmology"—truly quite comprehensive in range, and that "he has ever kept in mind the importance of not only treating the subjects exhaustively and intelligently, but in such a concise and simple manner" as to bring them within this range of readers by "careful explanation of the technicalities, giving the kernel without the husk."

The book is replete with illustrations displaying 23 colored plates, 351 in the text; many of the latter being reproductions of photographs. It consists of: Part I, Anomalies of the Refraction of the Eye, embracing an exposition of the principles of physiologic optics, anatomy of the eye, dioptrics, accommodation, examination of the eye and the varieties of ametropia, with a final chapter on the fitting of spectacles. A short appendix to Part I contains a display of test types. Part II, Diseases and Injuries of the Eye, devotes 12 chapters to the discussion of the anatomy, physiology and abnormal states of the eyelids, conjunctiva, sclera, cornea, iris, ciliary body, vitreous, chorioid, retina, crystalline lens, optic nerve and lacrimal apparatus. A one-page chapter mentions general embryologic derivation of the component parts of the human body, and seven chapters are given to glaucoma, sympathetic ophthalmia, heterophoria, extra ocular muscle paralysis and diseases of the orbit with a glossary adapted from Gould's and Dunglison's dictionaries giving the meaning and derivation of many ophthalmic terms.

The author's views are somewhat at variance with ours on several subjects, notably in his mention of the causal factors of erysipelas, concerning which he says: "In most cases I believe it to have been due to irritating effect of the dressings or toilet of the eye. The goldbeater's skin as well as the adhesive plasters are sometimes very irritative to the skin, especially of old people, causing erysipelas." We still pin our faith to the streptococcus. The author also evolves a very pretty theory in regard to mission of grafts of normal skin implanted after operation for the removal of malignant growths. These grafts transplanted into the midst of an aggregation of malignant cells spread the gospel health of their native soil with such convincing force as to convert the cannibalistic carcinomatous elements from their vicious character into one of benign and healing sympathy as steals away the sharpness of these quondam destroyers ere they are aware and straightway set they to the work of merciful repairing—behold!—a localized millenium!

The author next advances a view concerning the relation of presbyopia and glaucoma, which is, at least, absolutely original and—wheels within wheels!—an equally original view of the relation be-

tween presbyopia and senile second sight. Although the author's theories on these and several other subjects may fail to carry conviction, it cannot be said that they fail to excite a lively interest nor that they lack a distinct element of originality. The text, however, hardly furnishes a foundation of theory upon which an "undergraduate in medicine and the general practitioner" may build without the danger that the superstructure erected thereon may be subsequently assailed by those holding to the more generally accepted views on such subjects as are affected by the originality of the author. The book will be read with interest by ophthalmologists.

EUGENE RICHARDS LEWIS.

A System of Physiologic Therapeutics.

Cohen. A Practical Exposition of the Methods, Other than Drug-Giving, Useful in the Prevention of Disease and in the Treatment of the Sick. Edited by Solomon Solis Cohen, A. M., M. D., Professor of Medicine and Therapeutics in the Philadelphia Polyclinic; Lecturer on Clinical Medicine at Jefferson Medical College; Physician to the Philadelphia Hospital and to the Rush Hospital for Consumption, etc. In Eleven Octavo Volumes. American, English, German and French Authors.

Volume VI, Dietotherapy and Food in Health. By Nathan S. Davis, Jr., A. M., M. D., Professor of the Principles and Practice of Medicine in Northwestern University Medical School; Physician to Mercy Hospital and Wesley Hospital, Chicago; Member American Medical Association, etc. Published by P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, 1901. Price for the set complete, $27.50 net.

This book of Dr. Davis is the sixth volume of the above series, reviews of the first four of which have already been given in the ANNALS. It is in itself a complete and independent handbook of Dietetics, for the few cross references to the preceding volumes detract not at all from its individuality. There are 372 pages with XIII chapters in the first part—General Principles of Diet and Diet in Health—and XII chapters in the second part—Diet in Disease.

It is useless to try to add anything to the high praise I have already given to the mechanical excellence of the publisher's task, so I shall jump into the middle of things and give my impressions gained while reading the text. I was glad I did read it, for I am reaching that unhappy state of specialism where I can be accused of thinking that, and practicing as if, all diseases are dependent upon the eye, or rather of forgetting that many eye troubles have as a cause some systematic disorder that must receive attention—say some error in diet. I find that the dietist also has much to say, and that the ophthalmologist can learn much from reading Dr. Davis.

Everyone who has had the honor of knowing the Senior Davis will instinctively turn first to the chapter on alcohol to read what the Davis Junior has to say on the same subject, and he will read with delight the clear, practical, scientific, earnest and reasonable support which is given to the modern doctrine on alcohol. Not a word of fanaticism, but the logos of truth, that alcohol is harmful,

unnecessary and better replaced by other drugs; that it has its place and use, and may be taken by those who are not harmed thereby, as a pleasant adjunct to a meal, is what I judge the opinion to be, by my reading. I would have liked even more temperance in the text and am sorry that the author did not mention Kraeplin's studies, nor Brunton's experiments on furfurol; neither does he touch upon the still unsettled controversy of Atwater; but undoubtedly this is wise since controversy is not the function of the book.

The distinction between food eaten and nutrition is well explained, and the relationship of proteids to calories is made clearer than I ever found it before. In fact the tables given to illustrate various points are excellent, and though not all by any means original they aid materially to complete the ideas.

There is no faddism in the book; no attempt to push a theory of uric acid, or vegetarianism, or prepared slop. Really, uric acid receives nearly a black eye, for the diathesis is not mentioned, and those who expect to find an elaborate table for these unfortunate victims of the overworked kidney must go elsewhere.

Mixed diet is upheld for the normal man; overeating is condemned; milk in typhoid is still unsuperceded, and the various cures receive their due interpretation.

What to me is a novel improvement on many books on dietetics is the routine discussion of diet in all diseases, not excepting bronchitis, pericarditis, and such usually neglected topics. (Schenck's theory of diet in determination of sex is omitted—is it intentional?)

Hutchinson is quoted largely, but the tables from him are worthy of repetition. Another good feature is the introduction of statements as to the length of time various foods are retained in the stomach.

Perhaps in a Journal of Dietetics my remarks would seem crude and uncritical, but this is not meant for a technical criticism; readers of the ANNALS, I take it, do not know everything about Dietetics, and if they wish to become posted, I can advise Davis as a thoroughly readable and enjoyable authority. A. B. HALE.

A Manual of Ophthalmoscopy.

For Students and General Practitioners. By J. E. Jennings, M. D. (Univ. of Penna.) Author of "Color-Vision and Color-Blindness," etc.; formerly Clinical Assistant, Royal London Ophthalmic Hospital, London; Member of the American Medical Assn., etc. With 95 Illustrations and 1 Colored Plate. Published by P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, 1902. Large 12mo., 171 pages. Price, $1.25 net.

A systematic pictorial presentation of the ophthalmoscopic panorama has not been attempted so often but that there is room for this work of Jennings. It is neither a substitute for the various atlases (of which he mentions Frost as a type), nor is it to be compared with Gower's Medical Ophthalmoscopy, which illustrates the text by instances of particular pathologic cases. In fact, this manual really occupies a place by itself, and should be classed with textbooks of anatomy, physiology or of physical diagnosis. It is

readable, not discursive, perhaps dogmatic at times but thoroughly descriptive of the conditions as depicted by the instrument.

I have called the book systematic because in its nine chapters, after giving a description of the ophthalmoscope, it passes from the examination of the media to descriptions of the normal and abnormal fundus, giving in sufficient detail all the diagnostic characteristics the average students or practitioner is expected to know.

The illustrations in the body of the work accompanying the text are in black and white, similar to those we all love in Gower's book, and they answer their purpose well: I wish I could say as much for the ambitious colored frontispiece, which has seven pictures that represent neither the science of ophthalmoscopy nor the art of engraving. Like some Americans the author has not yet the courage to avoid the mixture of decimal and old English scales: his inches and centimeters fall at random from his pen. What should we think of a German who spoke loosely of meter and fuss!

The part of chapter III dealing with Retinoscopy might be omitted, for it is not complete enough to avail the student much and after all the retinoscope is not an ophthalmoscope. Treatment too, would look better in another book. Surely Doctor Jennings doesn't think that his few lines add anything to his pages. Make the reader learn his ophthalmology first, and then, if he needs it, run to his disease register for the drug. I know how hard it is to dodge a fascinating phrase, but his *this consists of* must be replaced occasionally, or the reader will go crazy. It is a rather fine distinction drawn between ischemia and anemia (p. 111) and the student will puzzle his brains many a day before he realizes that such a distinction is forgetable.

Fig. 77, on page 132, is explained as symmetric changes at the macula in infancy, but I wish the author had added *amaurotic family idiocy*, a well known term used by neurologists and perhaps more explanatory.

I suppose I could find other imperfections if I looked hard enough for them, but they would be so overshadowed by the excellencies of the book, in matter and manner, that they would not mar its merits. Let us hope that all will disappear in a second edition, for I am sure that the student will eagerly demand this book for a long time to come. A. B. H.

A Guide to the Microscopic Examination of the Eye.

Prof. R. Greef (Berlin). Translated from the Second German Edition by Hugh Walker, M. A., M. B., C. M. Surgeon to the Glasgow Royal Infirmary. Large 12 mo., 171 pages. Philadelphia, P., Blakiston's Son & Co. 1902. $1.25.

The original German of Greef's work on the Examination of the Eye was reviewed in the ANNALS at the time of its appearance (see ANNALS OF OPHTHALMOLOGY, 1899, p. 133) and was contrasted with the large and more ambitious work of Seligmann of about the same date. The opinion was then given that the book was conservative but elementary. This might apply to the teacher of pathology or

to one who was working with large laboratory equipment, but the present edition in English dress, prepared by the addition of new matter from the translator's hands, should meet fully all the wants of the student and routine worker in ophthalmology.

There are *two parts*, the first—*General*—dealing with methods; the second—*Special*—dealing with tissues. It is thoroughly modern, especially the chapter on the retina, and is really a laboratory hand book. There are few illustrations, as no attempt is given to stimulate the students imagination or memory, by pictures. I am sure that one must know a great deal before he finds the book incomplete. A. B. HALE.

Elementary Ophthalmic Optics.

Including Ophthalmoscopy and Retinoscopy. By J. Herbert Parsons, B. S., B. Sc., F. R. C. S., Curator, Royal London (Moorfields) Ophthalmic Hospital. Large 12 mo, 161 pages. Published by P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, 1902. Price $2.00 net.

Anyone interested in the mathematical side of optics—and I have no doubt that many a practitioner has been driven to the elaborate treatises of Helmholtz or Tscherning—will be delighted that from an English source comes a book dealing with the purer problems of optics as applied to Ophthalmology, yet I would not mislead the stndent by asserting that this is an easy volume to read or one that will give him a graphic insight into the physical laws under which we do most of our work. In fact the term *elementary* implies a far greater knowledge of mathematical processes than is retained by the student of medicine. For me to attempt to critizise it from the special view point of a mathematician would be worse than folly, and I am sure the readers of the ANNALS would not wish such a criticism; besides, I cannot give it.

The book has XI chapters dealing with light, refraction, the dioptric system of the eye, ametropia, the ophthalmometer, the ophthalmoscope and with retinoscopy, but all from the optical, not from the practical point of which practitioners think most. The diagrams and formulae are beautifully clear, and should afford instruction to him who wishes to work them out, and scattered through the book on every page are italicized sentenses emphasising important propositions, "so that those who do not care to grapple with the proofs are provided with a readily accessible synopsis of results."

In their succintness they resemble the Aphorisms of Donders, as for instance on page 96 *retinal image in the corrected aphakic eye is about a third larger than in the emmetropic eye*. All such are proved and cannot be gainsaid unless the mathematical demonstration is faulty.

The book is certainly the work of a scholar and should be commended as such, and I wish all ophthalmologists would read it, but I dare not say that it will become a popular book. A. B. HALE.

Annual Reports on the Progress of Ophthalmology.

Prof. Dr. J. von Michel, Berlin, Jahresbericht neber die Leistungen and Fortschritte in Gebiete der Ophthalmologie, bergündet von Prof. A. Nagel, redigiert seit dem Jahrgange 1877 von Prof. v. Michel. 31. Jahrgang, Report for the year 1900, 879 pages. Tübingen, H., Laupp'sche Buchhandlung 1902, 30 Mark. $7.50.

The Jahresbericht was founded by Prof. Nagel in 1872, with a report on the year 1870 and the aim to collect as completely as possible, to critically sort over and arrange the abundant, often hardly accessible, ophthalmological literature in a systematic form, enabling the medical practitioner to follow the progress of ophthalmology and utilize it for his practice. Especial stress has been laid on the connection with general medicine, and one section is devoted particularly to the relation of ocular affections to diseases of other organs. It is of very great value to the ophthalmologist in facilitating his studies and serves as a complete and convenient source of literary reference to ophthalmological authors. In the latter view the Jahresbericht has attained the first rank among ophthalmological periodicals which publish abstracts from literature. Its contents are divided into four sections: Anatomy and embryology of the eye, physiology, pathology and therapeutics, general and special parts with corresponding subdivisions.

The 31st vol. has the following collaborators: Prof. J. von Michel, Prof. W. A. Nagel, Berlin; Dr. J. Sobotta, Wuerzburg; Dr. K. Rhein, Muenchen; Prof. W. Schoen, Leipzig; Prof. L. Bach. Marburg; Dr. W. Hauenschild, Wuerzburg; Prof. O. Haab, Zurich; Prof. W. Czermak, Prag; Prof. A. Vossius, Giessen; Dr. Heine, Breslau; Dr. Hethey, Berlin; Dr. Helbron, Berlin; Prof. C. Hess, Wuerzburg; Dr. H. Koerber, Marburg; Prof. A. Wagenmann, Jena; Prof. G. Schleich, Tübingen.

Besides a table of contents, we find an index of authors, an index of subject matter and a very complete alphabetical bibliography of the year 1900.

We take great pleasure in heartily recommending the Jahresbericht to those of our readers who are not familiar with its great merits and usefulness. C. ZIMMERMANN.

Textbook of Neurology.

H. Oppenheim, Prof. Dr., Berlin, Lehrbuch der Nervenkrankheiten für Aerzte and Studirende. 3d. revised and enlarged edition, 1220 pages, with 369 illustrations. Berlin, S. Karger, 1902. 27 Mark. $6.75.

"The examination of the visual organ and acuteness of sight is of such paramount importance that in no case should it be neglected. The optic nerve which, as a peripheral part of the central nervous system, becomes visible to the eye of the investigator under the magnifying power of the refracting media, reveals the various diseases of the central nervous system and is one of the best guides in diagnosis. He who does not understand the use of the ophthalmos-

cope is no neurologist." This is the standpoint of O. who has presented us with the new revised edition of his excellent book. Whenever we find an ophthalmological allusion throughout the work we recognize the competent judgment of the author who, as a prominent investigator, has advanced this branch himself, and who is intensely familiar with the ophthalmological methods of examination and literature. We do not know of any other text-book on nervous diseases in which the eye receives so much attention as in this. Since the appearance of the first edition in 1894 the book has changed considerably, not only with regard to the richer contents, but also to the external appearance in both paper and print as well as in the number of illustrations, increased from 287 to 369. 75 pages are devoted to general symptomatology and modes of examination, then follow the diseases of the spinal cord, peripheral nerves, brain, with due consideration of psychiatric questions, neuroses, affections of the sympathetic nerve, angioneuroses and trophoneuroses, and intoxications specially influencing the nervous system. The style is admirably easy and pleasant and of one who masters his field, who does not teach simply traditions but speaks from his own large experience. Thus it contains many facts and observations, which O. has not published elsewhere or in any special work. On this the author lays special stress by desiring, if there was anything left for him to wish, with regard to the recognition of the work, that it would be more cited as an authority in scientific papers. If O., whose words we quoted above, insists on so much ophthalmological knowledge of the neurologist a visa versa seems to us quite as imperative. Certainly no oculist can safely be without a book on nervous diseases near to his hands for daily reference. He can do no better than to add this exceedingly good book of O. to his library.

C. ZIMMERMANN.

Sterescopic Medical Atlas.

Edited by Prof. A. Neisser. Ophthalmology by Prof. W. Uhthoff. Section 4 by Dr. Heine, Breslau. 12 plates with text, Leipzig, 1901. Joh. Ambr. Barth. M. 5. $1.25.

Stereoscopic pictures of anatomico-pathological specimens are of especial value in ophthalmology in which the discrimination of minute differences of depth is of paramount importance. Heine's plates demonstrate this in a very clear and intensely artistic manner. The swelling of the margin of the optic disc spreading like a wall toward the interior, the deepening of the vascular funnel and the tortuosity of the retinal vessels in papillitis in a case of cerebral tumor are beautifully illustrated. Likewise the glaucomatous excavation of the optic nerve on one plate in natural size, on another enlarged to five diameters, which also display the arrangement of the bloodvessels at the macula. Others show globes with cysticerci, glioma retinæ, typical sarcoma of the choroid, perforating sarcoma without detachment of the retina, annular conus, temporal conus in myopia, the anterior segment of the eyeball of a new born child seen from behind, and, for comparison, three human globes,

of a new born, an emmetropic adult and a myopic of 12 D, and sections of them. For study and demonstrations these plates are very useful and meet with our highest approval.

C. ZIMMERMANN.

Human Anatomy.

J. Henle's Grundriss der Anatomie desMenschen. Neu bearbeitet von Dr. Merkel, Prof. der Anatomie in Goettingen. Fourth edition. 802 pages with numerous, partly colored illustrations and an atlas of 498 pages. Braunschweig, 1901. Fr. Vieweg & Sohn. 28 Mark. $7.00. Handsomely bound 32 Mark. $8.00.

The fourth edition of this important textbook appears in an entirely changed form. The first volume, containing the text, has been newly written and considerably increased, in accordance with the latest researches. This was especially the case in the chapter on splanchnology, the sensory organs and the central nervous system. In a concise and clear style it presents all the essential facts, leaving out all superfluous matter. The description is vivid and gives exactly what we wish to know, carefully avoiding the brevity of a compendium, without spreading into the length of an extensive hand-book. The description is a most happy one and also displayed in external appearance, facilitating quick orientation. Especially valuable are the various outlooks from which the author views the study of anatomy. Even if it is impossible to follow in detail the path which the animal organization had to pass up to the formation of the human body, a general picture of this series may be gained, and, to understand its formation, the author illustrates, in the introduction, the progressive development of the animal world from the protozoa upward. Leaving hypotheses aside, the ontogeny demonstrates the very interesting fact, that the human embryo passes through stages, which we find as lasting conditions in lower fishes, amphibia, to say nothing of mammals, the organization of which approaches more that of man, the higher we proceed in the line. From the phylogenetic and embryological standpoint much light is shed on what formerly remained incomprehensible, as lusus naturæ, varieties, atavism and rudimentary organs. Each chapter is preceded by such general comparative anatomical and embryological remarks. Then the special embryology is considered, and the anatomical data given in relation to physiological functions, followed by an appendix on varieties and changes due to age. To present anatomy in this form is not only very fascinating for the reader, but is very apt to stimulate his biological thought, enabling him much better to commit to memory the otherwise dry facts. Not only the systematic anatomy but also the histological structures are exhaustively treated, and their importance duly set forth. Whenever a bone processus is described, the muscle is indicated to the attachment of which it serves, and in myology the functions of the muscles are exactly mentioned and the motor nerves, supplying them. The exposition of the most modern views as to the anatomical relations of the nervous conduction is very lucid and elaborate, as well as

the histology of the nervous system. At the end of the book follows a short guide for the technique of dissecting and an index of most important synonyms, systematically arranged. Since the author adopted in the text the anatomical nomenclature, introduced at the IX Anatomical Congress at Basel (1895), throughout, he added the synonyms for the benefit of physicians to insure the understanding of the not familiar new terms and as a guide in the labyrinth of old names in studying older medical works.

The 2nd volume contains the atlas of 498 illustrated pages, mostly in colors, which has also been entirely remodeled. It has been replaced by new and better ones. Short explanations are given on the same pages, and the names on the figures themselves are written out, not simply initials as in former editions, which greatly facilitates the understanding, while the numbers at the margin of the text in Vol. I, which gives the more minute descriptions, constantly refer to the illustrations. It represents the systematic anatomy in great abundance and different aspects, numerous microscopic drawings, to show the histological structures, embryological pictures (development of the bones, eyes, brain and heart), sections in different planes, three schematic figures and an appendix on the typographic dissection of nerves and blood vessels. The pictures themselves are of the greatest artistic perfection, simply beautiful. They were executed in the xylographic institute of the publishers who deserve the greatest praise for the splendid exterior of the two stately volumes, the price of which is very moderate. It is a most prominent work truly scientific and eminently practical which meets the requirements of the student and the physician in rare combination, who both will derive the greatest benefit from its study.

C. ZIMMERMANN.

The Therapeutic Value of Spectacles.

Feilchenfeld, Dr. H., Leubeck. 78 pages, Halle a/s. C. Marhold, 1901. Mark 2.50. $.65.

F. first considers the ailments in organs more remote from the eye, which may be cured by spectacles, pre-eminently headaches, due to muscular or accomodative asthenopia. As to conjunctival and nervous asthenopia he is rather sceptical. Asthenopia is defined as lowered endurance of the not inflamed eye. Marked irritations of the conjunctiva of various kinds are generally not the cause of asthenopia but the simultaneous sequelæ of accomodative and muscular disturbances. Particularly slight ametropia may cause greater asthenopic trouble than of higher degree, in which exact focusing is abandoned, especially in astigmatism from partial, and in anisometropia from unequal accommodation. Obstinate affections of the conjunctiva, due to ametropia, strikingly yield to proper correction by glasses.

While this has not been sufficiently appreciated, the orthopedic value of spectacles in muscular derangements has evoked an overwhelming literature. Since the knowledge and criticism of the various theories of strabismus is necessary for efficient treatment, F. enumerates them, viz: Strabismus may represent 1, the congen-

ital primary position, or 2, or it may be due to Donders' law of the synergy of accomodation and convergence, or 3, based on the fusion tendency, *i. e.*, strabismus is a central disturbance which prevents binocular fixation of one object. For No. 1, spectacles have the value of a specific, and act orthopedically in No. 3, *i. e.*, regulating refraction and stimulating fusion. These considerations are given in extenso. With regard to the relatively frequent occurrence of glaucoma in hypermetropic eyes, especially at the presbyopic age, F. utilizes the observations of Cohn, Sattler and Hess that the intraocular pressure is not increased by accomodation, by the advice to stimulate glaucomatous presbyopic eyes to lively accommodative impulses by weak corrections. F. believes in partial accommodation in astigmatism, and always corrects the latter especially for near work. Perhaps the change of curvature of the cornea which progresses in a perverse sense, may be due to partial accommodation. Under its influence hypermetropic astigmatism may appear as simple myopia at the subjective test, which is of great practical importance.

The difficult and responsible question as to the treatment of myopia with spectacles is ventilated in great detail. It is of prophylactic nature as well as the correction of anisometropia. By the result of steroscopic examinations of quite a number of anisometropes of various kinds F. repudiates the general erroneous opinion that anisometropes with sufficient vision, who use one eye for distance the other for nearby, have no binocular vision. The author aims in such cases to approach the refractions of each eye, but not to transform them in emmetropia. Particularly in anisometropia the therapeutic value of spectacles is remarkable.

In all the spheres of action, dwelt upon, the proper correction by glasses has not only a somatic healing effect but also upon the development and moulding of the physche. The sensory and especially the visual, impressions are nourishment for the brain. If curtailed, like myopia, a certain narrow, limited mental type develops that loses its connection with the outer world, from which it receives no experience and training. Thus spectacles become remedies in a higher sense and the physician becomes a pedagogue.

C. ZIMMERMANN.

Relation of General and Organic Diseases to Changes and Alterations of the Visual Organs.

A. Groenouw and W. Uhthoff, Professors at Breslau. Graefe-Saemisch, Handbuch der gesamten Augenh.; 2nd edition, newly written, with illustrations, Nos. 35 to 38. Leipzig, 1902, W. Engelmann. Subscription price, 8 Mark. $2.00.

Section VI deals with the relations of skin diseases to the visual organ. Eczema of the face and head, or even extensive general eczema, are often accompanied by mucopurulent or phlyctenular conjunctivitis and keratitis. The concomitant swelling of the cervical glands is not always due to scrophulosis as it speedily yields to proper treatment. On the other hand the inflammation may spread from the conjunctiva to the skin, e. g., if caused by decom-

posed solutions of atropin, yellow oxide of mercury or white precipitate ointments. Propagation of psoriasis of the face to the conjunctiva in form of red patches is rather rare, and the conjunctivitis in psoriasis may be due to chrysarobin used for its treatment. Lichen ruber planus has also been observed on the conjunctiva. Pemphigus of the conjunctiva may occur simultaneously with that of the skin or may be isolated and then its differential diagnosis from trachoma is at first difficult. The presence of pannus is in favor of trachoma. The retinal hemorrhages, retinitis and optic neuritis after combustions of the skin are very likely due to changes of the blood as hemoglobinemia or to embolism or thrombosis like those in the intestines and kidneys. Only after exclusion of all other etiological moments the influence of colds on the visual organ may be admitted. Elephantiasis Arabum of the lids is strikingly illustrated by quoting a remarkable case of Walzberg with picture. Conjunctivitis and edema of the lids has been observed in urticaria after injestion of strawberries, antipyrine, etc. Of parasitic skin diseases we here mention only demodex folliculorum, which is not only found in certain form of blepharitis, but also on perfectly healthy ciliary margins. Whether it may have some graver pathological importance in man (as found in the dog by Pick) and may be the cause of certain forms of acne, has not been sufficiently investigated. Two illustrations by Raehlmann are reproduced. Diseases of the bones, joints and muscles and the visual organ are not unfrequently associated symptoms of general affections. Abnormities (Turmshaedel, tower skull), and diseases of the adjacent bones (hyperostosis, rachitis), may produce displacements of the eyeball, but do generally not change its shape. If leading to compression of the optic nerve, complete or partial atrophy of the latter will ensue.

Section VIII treats of the ocular affections in chlorosis, asthenopia, conjunctivitis sicca, changes of the retinal vessels, as lighter color of the veins within the pale of the disc, due to diminished contents of hemoglobin (first observed by Uhthoff), anemia and hyperemia of the retinal vessels, arterial pulse (Raehlmann), hemorrhages in retina and vitreous (rare), neuro-retinitis and papillitis, probably due to edematous infiltration or hemorrhages in the optic sheath, thrombosis of the central veins, white patches of fatty degeneration similar to those in albuminuric retinitis. The latter, as well as retinal hemorrhages per diapedesis, rhexis, or from embolism of the capillaries are more frequently an important ocular symptom in primary pernicious anemia, but may also be found in secondary anemia, owing to helminthiasis (ankylostomum duodenale), carcinoma, tuberculosis, etc., as retinitis cachecticorum. Visual disturbances and amaurosis, due to retrobulbar neuritis or atrophy of the optic nerve, are observed in rare cases after sudden loss of blood from various organs, but mainly previously diseased persons. Retinitis is a constant symptom of leukemia, further hemorrhages of lids, conjunctiva, anterior chamber, vitreous as well as in pseudoleukemia (Hodgkin's disease) lymphomata of the lids. Scurvy, prupura, morbus maculosus werlhofii, peliosis rheumatica predis-

poses to hemorrhages of the visual organ, while ocular affections in hemophilia are rare. In myxedema sheding of the hairs of the eyebrows is an almost constant occurrence. Excessive use of thyreodian tablets must be avoided, else they are apt to cause serious general disturbances and diseases of the optic nerve. Save small pigment dots in the ocular and palpebral conjunctiva no eye symptoms are met with in Addison's disease.

Quite a space is given to eye diseases occurring in diabetes: Changes of accommodation and refraction, opacities of lens, opacities and hemorrhages of vitreous, retinitis (with pictures) affections of the optic path and central organs, palsies of the muscles, iritis, choroiditis, and abcesses of the lids. The prognosis as to duration of life becomes not as unfavorable by the ocular complications as in albuminuric retinitis. Then follow the affections of the visual organ in gout, scrofulosis and those due to general debility, as keratomalacia, hemeralopia and xerosis, glaucoma, anomalies of the muscles, marantic thrombosis of the central retinal vein and enophthalmus, and the influence of tumors of other parts of the body on the eye in giving rise to metastases or by the resulting cachexia. A very interesting essay on the behavior of the eyes during sleep and their alterations after death, concludes this chapter.

In the following section IX G. discusses very elaborately, on 80 pages, the hereditary diseases of the eye. The following diseases have, with more or less right, been regarded as occasionally brought about by hereditary: Irideremia, cataract, ectopia lentis, diseases of the retina and optic nerve, hemeralopia, albinism, color blindness, glaucoma, anomalies of refraction, microphthalmus and hydrophthalmus, anomalies of the lids, ocular muscles, and stenosis of the lacrimal duct. For some of them a law may be formulated which, however, is not applicable for each case, although for the most. No certain reason can be given for this, we must content ourselves to study the manner of hereditary propagation of each affection.

We endeavored to give the reader an idea of the completeness and thoroughness of the present numbers, which contain numerous illustrations and three lithographic ophthalmoscopic plates, and we anxiously hope that the great encyclopedic work will be completed at not to remote a date. C. ZIMMERMANN.

Visual Economics, with Rules for Estimation of the Earning Ability After Injuries to the Eyes.

By H. Magnus, Med. Dr., of Breslau, Germany (Professor of Ophthalmology in the University of Breslau, etc., etc.), and H. V. Würdemann, M. D., of Milwaukee, Wis., U. S. A. (Professor of Ophthalmology to the Milwaukee Medical College, etc., etc.). For the Use of the Medical and Legal Professions, Business Corporations, and Insurance Officials. . . . Published by C. Porth, 105 Grand Avenue, Milwaukee, Wis., U. S. A., 1902 (Price, $2.50).

This important work, the first of its kind in the English language,

is the outcome of Magnus' well known "Leitfaden für Begutachtung und Berechung von Unfallbeschaedigungen der Augen," which appeared in two editions in the years 1894 and 1897. A demand for a simple translation soon made it evident that the work would have to be rewritten, and new matter to meet the requirements of American and English readers inserted: this task has, with the consent and the aid of Professor Magnus, been done by the American author. The work properly starts with the proposition that "most indemnity claims in America are adjusted according to the opinion of a reputable physician, more especially on the advice of the official medical adviser or examiner of insurance, traffic or manufacturing company, or of the U. S. Pension office physician, or upon the sworn statement of those deputized for examination of the special case, with the exception of contested cases and suits for damage, etc., which are settled in the courts of law."

After discussing and discarding the methods of Zehender, Groenouw and Heddaeus for the estimation of loss of the earning ability, for ocular injuries, the authors properly state that normal physiologic vision consists of a series of different factors: the central acuity, the visual field, light and color senses, the adaptive faculty, the muscular movements and the cerebral processes, all acting together in creating the sense of sight. We may, therefore, they say, regard the act of seeing as a sum whose numerals are formed by the different functions: "If one numeral be taken from the sum which represents the complete act of seeing, then the balance will be left, i. e., vision will be damaged to the extent of the loss of one of these visual functions; but vision is yet in existence in a limited way." In the manufacture of a formula for physiologic vision, they say, "we would have to consider that in losing simultaneously the two most important factors, central and peripheric vision, the act of seeing would be *nil*; but from an economic standpoint we could not get along with this idea. The different secondary functions forming sight have different valuations."

They believe that the visual acuity, the field of vision, and the muscular movements are of such importance that they think they can properly estimate the results of ocular traumatism by taking into consideration only these three. "These, they say, are to be regarded as the factors of a product and multiplied." Practical experience shows them that they must do this under all circumstances, because for the following of a vocation, none of these factors could be damaged or left out, for without them the earning ability would disappear. In their own words: "If a person loses the central acuity of both eyes, then we certainly have complete earning disability; not even the common laborer having lost his central acuity could do his former work. Such an individual could only take very low grade positions, such as that of a messenger. The possibility of doing much work in the several trades after the loss of central acuity is so completely excluded from consideration, that it would be extremely incorrect if we did not consider an artisan, who had a large central scotoma, i. e., lost his central visual acuity, entirely unable to pursue his vocation and earn anything."

They also remind us that if the peripheric vision is lost in both eyes, working at trades is likewise excluded, as is readily seen in cases of double-sided hemianopsia. A working man with total paralysis of all the outer ocular muscles is likewise totally disabled. In such a case he will stare into vacancy and cannot work in a binocular manner. He would lose the ability to estimate distances and the size of objects, and could only have a certain degree of monocular vision, which could be imagined to be useful only in certain special cases, as that of a nearsighted clerk.

In building up a formula for the act of seeing in relation to earning, they denominate the central acuity with the letter C and the visual field with P. The valuation of the muscular motions, M, they say, offers certain difficulties: because "the influence of a disturbance of the function in a single ocular muscle, from a professional standpoint, is quite a different one, whether we take into consideration monocular or binocular vision. The monocular act is but slightly affected by paralysis of one ocular muscle, as it only diminishes the motility of the eyeball, but in binocular vision the factor of diplopia comes in, and this is of the greatest importance, as it excludes, temporarily at least, retention of working binocular vision." In formation of their formula they would, therefore, treat the factor of muscular movements in a different manner, when treating of binocular vision, than they would for the monocular act. In the formula for binocular vision they take the muscular movements of each eye as the product of different factors, each of which corresponds to the activity of a particular muscle. Now, as they say, "if we mark the muscles of one eye with (m_1 m_2 m_3 m_4 m_5 m_6) and those of the other (m'_1 m'_2 m'_3 m'_4 m'_5 m'_6), etc., we would represent the whole muscular activity as (m_1 m_2 m_3 m_4 m_5 m_6) (m'_1 m'_2 m'_3 m'_4 m'_5 m'_6)." In this connection, they state, the whole product would be 0, by losing one single muscular motion, and therefore the binocular act would be negative. In monocular vision they believe the muscular activity should be conceived as the sum of the single performance, because "by losing one of them only an ocular detriment has been created, and not total earning disability, thus, $m_1+m_2+m_3+m_4+m_5+m_6$."

In speaking of the estimation of the economic limitations of the central visual acuity, they persistently state that "the central acuity lies within well-known physiologic limits. When it falls below these, the function itself is damaged, but the conditions met with in practice are not such that the physiologic and earning limitations of the central visual acuity are interdependent. "If we desire to have a general rule for the ability of every single ocular function, an average value must be found by many single measurements, but such average values permit of many exceptions and cannot be designated as the average limiting value of the earning ability, for, if such were the case, each variation therefrom might be termed a damage to the earning ability." This may be done, they say, by individual measurement of each factor in each case, but such always bears an individual stamp. We must not, they tell us, forget that, while the limit values of every function have a scientific mean-

ing, the conditions met in actual practice are different. Science calls an individual blind only when perception of light has entirely disappeared, but, in actual practice, he is blind if the faculty of sight has been weakened to such an extent that the organ of vision cannot be used to earn a living. The meaning of blindness, as used in daily life, is within the limits of that of science. Further, they remark, "neither the lowest nor the highest points of scientific visual acuity correspond with that used in business; the lowest point of the latter is not as low as the lowest point laid down by science, while the highest point of the functional range that may be regarded as normal must be considered greatly below the highest scientific limit. The highest as well as the lowest demands of the different professions upon the central acuity differ greatly, and we have no proper standard for their exact numerical estimation."

They believe that the limits of peripheric vision are to be regarded from either a scientific or an economic standpoint, and, as has been shown in discussing the visual acuity, are quite different. Peripheric limitations or even greater defects of the field of vision, if only in one eye, and, under certain circumstances, a moderate limitation of the visual fields of both eyes, will not impair their earning capacity. "We would (they say) only regard limitation of the field of vision as entitled to an indemnification of the limits for white in the binocular field are temporal 70°, nasal°, superior 40°, inferior 60°; and in the monocular type, temporal 70°, nasal 45°, superior 40°, inferior 65°." This corresponds, they inform us, to those limitations which Haab adopts as the narrowest ones admissible under normal conditions. The suggestion of Schroeter, they say, is very useful in estimating the amount of economic damage to the field of vision. Therefore, like Schroeter, they divide the binocular field into three zones of 30° each: the first from the outermost periphery to 60°, the second from 60° to 30°, and the third from 30° to the point of fixation. "It is evident (they state) that these three zones do not have the same value functionally; the inner one has the most, the outer the least." Nevertheless, they do not give them a different value like Schroeter does, as it complicates the subject too much. They are of the opinion that the functional differences of those zones can hardly render itself felt economically, for the outermost zone of the field of vision represents a much greater range of the retina than the central, and the intermediate one represents a greater range than the inner one. "But what the outer zone lacks in functional ability, compared with the two others, it makes up by its greater extent, so that for practical use the extent of the different zones is compensated for by the relative difference in the functional ability; therefore, we give each of these zones the same value. The entire binocular field of vision, P, would be composed of three factors of equal value. According to this, all defects of the field of vision could be given their numerical valuation; for instance, with the loss of one eye we would lose 1/6 of the binocular field, with a homonymous hemianopsia 3/6, etc."

In regard to the economic relations of the ocular musculature and

their estimation, they say, "the outer ocular muscles have their peculiar relations to the earning power. In view of the fact that the binocular act of vision in its earning relations may only be regarded as preserved if all the ocular muscles be unimpaired, the functional disturbance of one single ocular muscle is a bad one, because with the paralysis of one muscle, diplopia appears and immediately suspends the binocular act, causing thereby complete exclusion of the affected eye. Therefore, if both eyes are functional and the act of vision was binocular, a paralysis of one ocular muscle should be regarded from an economic standpoint in the same light as the complete loss of one eye, and the diminution of the earning ability must be the same as the loss of one eye, even if it be only temporary. Less consideration should be claimed for the loss of the function of one ocular muscle if the act were previously monocular. In such a case the loss of one muscle is only an inconvenience or may be termed a small injury. They regard the action of the outer ocular musculature as a sum of different muscular actions, corresponding with the number of the outer muscles, which makes a sum of six individual functions. They go on to state that "by omitting one muscle, the muscular action will appear in the formula for the act of vision as a fraction, 5/6."

The fact that the six outer muscles of the eye are not of the same relative value for the earning capacity has also to be considered. Quite different demands are made by certain avocations; for instance, in the case of miners, the rectus superior is particularly needed while in other trades it is but little used. In all factors demanding clear vision in the distance, as that of sailors, the rectus externus is more used than in those professions whose work is near the eye; in the latter the rectus internus is the prominent muscle and for general use they think that the internal rectus should be given the most prominent place as regards the earning capacity. This varying value of the outer ocular muscles in the different professions makes the valuation somewhat difficult they say; for, if they guage the muscles by the standard put for one certain vocation, they would make a mistake. For instance, if they give the valuation to rectus superior that is needed in the case of a miner, it would be overvaluation for most of the other professions and an under-valuation of the other muscles. It is, therefore, for ordinary purposes, necessary to regard the outer ocular muscles as of equal value and to give each 1/6 of the total. "But in special cases we can do justice to the demands of the different professions and when necessary value them higher, for instance, 2/6 or 3/6. We have deemed it necessary to introduce the muscular action as a root value in the full formula for the act of vision."

They believe that in only exceptional cases could injuries of the intrinsic muscles (affecting the accommodation or the pupil) have special influence upon the earning ability, because, by the use of suitable convex glasses, the derangement may be overcome.

Coming to the question of the meaning and estimation of the ability to compete, they rightly state that when an individual re-

ceives an accidental injury, especially that of vision, the damage to him is a double one. First, there is the impairment of his working ability from the results of the accident in that he cannot perform as good or as much work as formerly, and second his chances for obtaining work quickly and easily are less. They tell us that this second factor is not so unessential as one might suppose. Practical experience shows that the one-eyed person not only has more difficulty in finding employment, but that in some factories his visual disorder makes it difficult for him to retain his employment. Workmen with sound eyes are preferred by some employers of labor and from their standpoint, certainly not without reason. The injured person, therefore, has a right to claim not alone a compensation for the impairment of his capacity for work but also the difficulty which he encounters in making the most of this capacity. Therefore, in estimating the impairment of the earning ability, they have always and under all circumstances to consider the diminution of the ability to compete. Stating this ability as a numerical quantity, they find that the formula they have adopted "adapts itself to the peculiarities of the individual case and to the judgment of the physician, avoiding thereby a rigid form and doing justice to both parties."

Its calculation which is given in careful detail can be so simplified by construction of certain diagrams and curves which are given, they say, as to be understood and accomplished by even an inexperienced mathemathician. Reservation, they properly state, must be made in cases where the injured person had possessed only one eye or was weak sighted before the time of the accident. In such cases, they believe shat special modifications of the calculation have to be made: these they take into special consideration and offer a most elaborate index for the purpose of ready reference.

According to the authors' calculations, "approximately a one-eyed person has lost 30 per cent. of his earning ability for the first year after the accident and 20 per cent. afterward for the higher class of trades, and for the lower class the proportion would be 27 per cent. for the first year and 18 per cent. thereafter." If, however, following the injury the eye becomes blind slowly, the person is thus able to adapt himself to the ocular consequences of being one-eyed. "The impairment of earning ability from the gradual loss of the sight in one eye following the accident in trades of higher visual demands is 21.9 per cent. and in professions with lower visual demands 18.3 per cent." The calculation may be expressed in dollars and cents depending upon the probable future earnings.

Estimation of the pecuniary loss to the individual by reason of visual imperfections is next considered, and with the aid of several examples is considered most fully.

Part fourth of the work is made up of most interesting and useful tables for the estimation of the different forms of damage to the visual earning ability: They are most graphic and can be usefully referred to a moment's notice.

A good bibliography, plates of near and distance test types, most excellent graphic delineations of field losses, and curves for the valuation of the visual field, of the muscular action, and of the ability to compete, complete the volume.

The reviewer, who has given much consideration to this character of ophthalmic study, heartily recommends, not only a single careful perusal of the work which he has only known in its less perfect original, but offers his conscientious hope that the book may be made a conveniently placed guide to all those—both professional and layman—who in any way may be interested in the question: a question that has no greater import in all of the wide domain of ophthalmology. C. A. Oliver.

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THE OPERATION OF ADVANCEMENT OF A RECTUS MUSCLE.

BY CLAUD WORTH, F. R. C. S., ENGLAND,

LONDON.

ILLUSTRATED.

Most ophthalmic surgeons are agreed that, *theoretically*, the best operation for squint is the advancement of a rectus muscle, with or without tenotomy of the opposing muscle. But, in practice, the vast majority of surgeons content themselves with tenotomies. The reason for this is that the operative procedures commonly employed in advancement are very unsatisfactory and uncertain in their results.

I have tried, many times, most of the operations which are to be found in the literature of the subject. The two which gave the best results were: 1. That in which two or three sutures are passed through the cut end of the muscle and through the tough tissue near the corneal margin. But, in this operation, the sutures cut their way through at the muscle end within the first three or four days, so that the final result is uncertain. So much so that a surgeon who had employed this operation for years told me that he always tried to produce as great an effect as he could in order to allow for this giving way. 2. The operation in which the suture is knotted on the muscle. This operation produces, as a rule, good *immediate* results, but most of the cases relapse after a few weeks or

months. This is due to the fact that the muscle atrophies in front of where it is strangled by the sutures, so that it is only attached to the globe by its lateral expansions.

I devised the operation I am about to describe with a view to combining the advantages and avoiding the great disadvantages of the two procedures mentioned above.

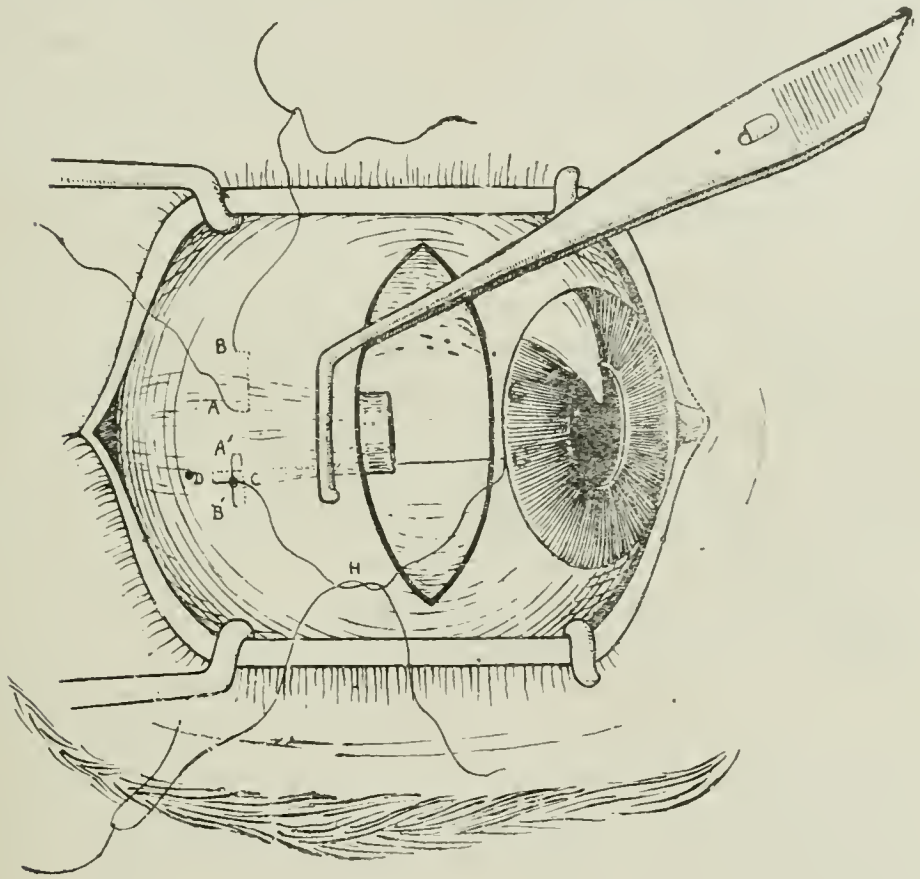
AUTHOR'S OPERATION. The instruments required are: speculum, straight blunt-pointed squint scissors, toothed forceps, Prince's advancement forceps, needleholder with jaws suited to the curve of the needles, two very sharp curved needles and two sutures.

The suture material is a very important detail. It should be thick. The thin stuff sold as "eye silk" cuts like a knife. I use thick black silk.* prepared as follows: A reel of the silk is wound loosely round a winder (made by bending up a piece of galvanised iron wire). It is boiled in water, to sterilize it and to remove the superfluous coloring matter. It is then dried before a fire. One end is then threaded through a hole in a lead weight. The lead weight is then dropped into a beaker of very hot paraffin wax (to which a little vaseline has been added). In this way the whole thread is drawn through the boiling wax as it is unwound from the winder by an assistant. It is wound on a large glass reel and is kept in a clean jar, always ready for use without further preparation. In preparing for the operation, a piece of the silk about a foot long is drawn out of the jar with sterilised forceps. It is threaded through a very sharp, full-curved eye needle as far as its middle. The two halves of the waxed silk thread are then twisted together with the fingers into a single cord. The part of a suture which experiences the greatest resistance in passing through the tissues is that near the eye of the needle. The thread must be double here, in any case, so one may as well have the benefit of the double thickness throughout. This wax-soaked thread has sufficient stiffness at the ordinary temperature of the air to prevent kinking during the operation; but at the body temperature, it is quite supple. It glides easily, and with a minimum of damage to the tissues—like a well-greased catheter. It is practically non-absorbent—a most

*I use black silk, made for sewing boots, marked No. 24, made by W. H. Staynes and Smith, Belgrave Gate, Leicester, England.

important matter in a region which cannot be kept absolutely aseptic. I find that the wound heals more quickly and with less conjunctival edema than when undressed thread is used.

The Operation. For quite young children, I prefer chloroform anesthesia; for older patients, cocain is sufficient, either in the form of powder or 10 per cent. drops. The conjunctival sac is then then throughly cleansed with boric lotion. Just before beginning the operation a few



drops of suprarenal gland extract are instilled (Parke, Davis & Co.'s "Adrenalin" solution acts well). A drop of the extract and a drop of the cocain, if this is being used, are instilled from time to time during the operation. The vascular constriction caused by the extract makes the operation bloodless, or nearly so, so that the surgeon is not impeded in his work by the necessity for constant sponging. A few drops of lotion should be squeezed into the eye every few minutes during the operation, to prevent damage to the cornea by drying.

The patient lies on a table. His lids are held open by a

wire speclum. The surgeon standing behind the patient's head seizes the conjunctiva with the toothed forceps, and, with the scissors, makes a straight vertical incision through it, about half an inch long. The middle of this incision comes close to the corneal margin. A similar incision is then made through the capsule of Tenon. The conjunctiva and capsule usually then retract as shown in the diagram. If they do not they are pushed back, so as to expose the insertion of the tendon. The female blade of a Prince's advancement forceps is now passed under the tendon, after the manner of a tenotomy hook, the male blade being superficial to the conjunctiva. The forceps is now closed, so that tendon, capsule of Tenon, and conjunctiva are all firmly clamped together, with their relations undisturbed except for the retraction of the membranes. The tendon, and a few little fibrous bands beneath the tendon, are now divided with scissors at their insertion into the sclerotic. The Prince's forceps holding the tendon, capsule, and conjunctiva can now easily be lifted up so as to get a good view of the underside of the muscle. One of the needles is then passed inward at A, through conjunctiva, capsule and muscle, and brought out at the under side of the muscle. It is then again passed through muscle, capsule and conjunctiva and brought out at B. The bight of the thread thus encloses about the lower fourth of the width of the muscle, together with its tendinous expansions and capsule and conjunctiva. The other needle is similary entered at A', passed through conjunctiva, capsule and muscle, and brought out at the under side of the muscle. It is then entered again at the underside of the muscle and brought out through the conjunctiva at B', the bight of this suture thus inclosing the upper fourth of the width of the muscle, etc. The object of inserting both sutures before proceeding further with either is that they may be symmetrically placed. The ends of the thread from A' and B' are then knotted firmly at C. The end bearing the needle is then entered at D, and passed through conjunctiva, capsule and muscle, and carried beneath the lower blade of the Prince's forceps nearly to the corneal margin. The needle is here passed through the tough circumcorneal fibrous tissue and brought out at G. The two ends of the thread are then temporarily

tied loosely, with a single hitch, at H. The first suture is then similarly dealt with. The anterior part of the muscle, and capsule, and conjunctiva are then removed by cutting them through with scissors behind where they are grasped by the Prince's forceps. The gap is then closed by tightening and securely tying each suture HH, so that the eyeball is rotated into its correct position and the anterior end of the muscle is brought nearly up to the corneal margin at GG. The longitudinal position on the muscle of the knots A. B. C. and A'. B'. C'. varies according to the degree of rotation required. In operating under cocain the immediate effect is the permanent result. No over-correction therefore is necessary. In operating under a general anesthetic the eyes temporarily diverge or converge so that one has to bear in mind the angle of the deviation and produce approximately that degree of rotation.

A firm unyielding hold is got for the sutures at each end, so that any desired degree of rotation of the eyeball may be produced, according to the position of A. B. C. In a case in which the deviation does not exceed 15 or 20 degrees I advance the external rectus without tenotomy of the internal rectus. For much higher degrees I usually combine tenotomy of the internus with advancement of the externus, not because the advancement will not alone produce all the effect required, but to avoid the retraction of the globe and narrowing of the palpebral fissure which would otherwise occur.

The anatomical relations of the muscle are disturbed as little as possible. As the middle part of the muscle is not included in the sutures, its main *blood supply is not interfered with*. The immediate effect produced is the final result. So far, I have had no relapse in any case in which I have advanced the external rectus by this method.

In a case of convergent squint there is not infrequently a slight vertical deviation also. If this is not too great it may be corrected at the time of the operation. If the operated eye deviates downward the sutures at GG should be so placed as to attach the muscle end at a somewhat lower level near the corneal margin. If this eye deviates upward, the muscle end should be attached at a slightly higher level. It is easy to produce a vertical effect of

four or five degrees in this way. In this case, of course, a rotation about a fore-and-aft axis is also produced. In a case in which the operation is performed merely for its cosmetic effect this is of no consequence. In a case however in which I have previously trained the fusion faculty with the amblyoscope the "desire" for binocular vision is quite able to overcome this axial rotation.

In the interests of binocular vision the eyes are able to overcome a considerable horizontal deviation or axial rotation but they are seldom able to overcome a vertical deviation if this exceeds about three degrees.

A SUBCONJUNCTIVAL DERMOID CYST.

By James Moores Ball, M. D.,

St. Louis.

The case to be described appeared in the ophthalmic clinic of the St. Louis College of Physicians and Surgeons, Feb. 25, 1902. The following history was obtained:

J. G. R., of Lenzburg, Ill., farmer, aged 40 years. Eight years ago he noticed a small red spot at the corneo-scleral junction on the nasal side of his right eye. It grew slowly without pain except during a brief attack of conjunctivitis. At this time the growth was rounded; about eighteen months ago he noticed that it had become elongated vertically and seemingly was divided into two lobes, an upper and a lower.

Examination shows Mr. R. to be in good general health. His left eye presents two pterygia of ordinary size. The right eye shows the presence of pterygium on the temporal side of the bulbus, while the inner canthus and part of the nasal aspect of the cornea are occupied by a tumor. The tumor is hard and inelastic, only slightly movable and is of a pale-yellow or straw color. Along its upper and lower borders, and passing over it in an antero-posterior direction are numerous minute blood-vessels. The growth measures vertically 13 mm.; horizontally 10 mm.; its height is 3.3 mm. and it extends upon the cornea 5 mm. At the inner canthus a pterygium-like mass is attached to the inner margin of the upper eyelid through 2 mm. of its extent and also covers the carnucle. This tissue, passing from the inner canthus, is thin and tense, apparently being lifted up by the underlying tumor, over which it spreads to find attachment in the cornea.

Vision of this eye $= {}^{20}/_{30}$. The fundus is normal. The reduction in visual acuity is attributed to astigmatism produced by the growth.

Diagnosis: The tumor was regarded as a subconjunctival cyst.

Treatment: The growth was excised. It contained a thin yellowish fluid.

Pathologic examination: Sections of the growth were kindly made by Dr. Carl Fisch, of St. Louis. They show a tissue richly supplied with spaces. These spaces are lined with layers of epithelial cells resting on a layer of dense, thin, fibrous tissue, under which is areolar tissue—the whole resembling the structure of the skin. No sebaceous glands on hair follicles were present, although careful search was made for them. Pathologic diagnosis, dermoid cyst.

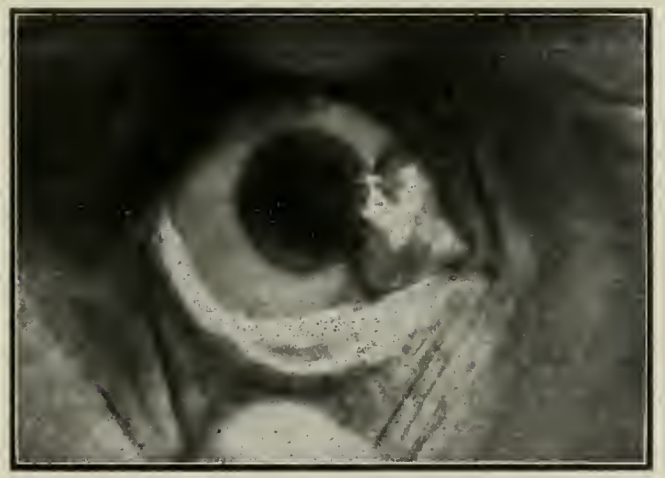
REMARKS.

Subconjunctival cysts occur as small elevated tumors of an orange color, or translucent or gelatinous appearance, found beneath the bulbar conjunctiva. Numerous vessels ramify over the cyst wall and others are prominent along the borders of the growth. Such a cyst is only slightly or not at all movable upon the eyeball. It may remain entirely subconjunctival, or may encroach upon the cornea, lifting up the superficial corneal layers like a pterygium.

The origin of such cysts has not been definitely settled. Rogman states that they result from the growth of infoldings; the Italian ophthalmologists attribute them to the closure of Krause's glands; Ginsberg, Vossius and Wintersteiner attribute them to the deep growth of superficial epithelial layers in which regressive metamorphosis and mucous degeneration have taken place. Such an abnormal ingrowth of the epithelium may be present as a congenital condition or may be produced by chronic catarrh. Normally it is found only in the limbus. In this connection it is apropos to state that the patient whose case I have described, for many years has had pterygia and chronic catarrhal conjunctivitis.

A form of subconjunctival cyst which seems to be of rare occurrence has been described recently by Fehr* under the name of "Gelatinous Tumor of the Conjunctiva" (Gelitanöse Geschwulst der Bindehaut). He describes three cases. . each the cyst was located beneath the

*Centralblatt für Augenheilkunde, July, 1901.



bulbar conjunctiva. In all the color and general appearance of the tumor corresponded to the case described above. Microscopic examination, which was made in one of the three cases, showed the growth to be a multilocular cyst of the subconjunctival tissue with a rich aggregation of cells in the cavities. The superficial epithelium was drawn inward; the cells were partly epithelial, partly lymphocytes. Some of the cavities were clear while others showed cells, cell detritus, and reticulated granular threads of mucin or albumen. Beneath the superficial epithelium there was granular pigment, partly free in the subconjunctival tissue, partly within the cells. It is a matter of regret that two of Fehr's cases of so-called gelatinous tumor of the conjunctiva refused to accept operative invention. Cases similar to those reported by Fehr have been observed by Jaquet and Schrapinger under the name benign cystic epithelioma of the conjunctiva; and another case supposed to be of the same nature has been reported by Piudikowski and was named by Wintersteiner naevus pigmentosus cysticus. The whole subject of conjunctival and subconjunctival cysts is in a chaotic state. Let us hope that some American ophthalmologist will elucidate it.

ADENOMA OF THE LACHRYMAL CARUNCLE, WITH THE REPORT OF AN ADDITIONAL CASE.*

By C. A. Veasey, A. M., M. D.,

PHILADELPHIA.

Primary tumors of the lachrymal caruncle are of exceedingly rare occurrence. In 1897 the writer reported† a case of primary sarcoma and reviewed the literature prior to that report which included five cases. Since that time at least one additional case has been recorded.‡ Primary papillomata of the caruncle are also occasionally met with. Last year Posey and Shumway‖ reported such a case before this section, and reviewed the literature pertaining thereto. Adenomata are also occasionally seen, having their origin primarily in the caruncle, a few such cases having been recorded. Thus Testilin§ reports a case in a female, aged 18 years. The tumor had existed for some time and was situated at the internal angle of the right eye. There was no pain. It occupied the superior external portion of the lachrymal caruncle and encroached on the semi-

*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, Dec. 17th, 1901.

†Arch. of Ophthal., Vol. XXVI, No. 2, 1897.

‡Primary Melanotic Sarcoma of the Lachrymal Caruncle, Simeon Snell. Arch. of Ophthal., Vol. XXVI, No. 3, 1897.

‖University Med. Bulletin, Nov., 1901.

§Adénome de la caroncle lachrymale. Dictionaire des Sciences Medicales, 1st series, No. 12, pp. 615.

lunar fold, involving the bulbar conjunctiva. It also extended almost to the internal border of the cornea and was about the size of a large "chick-pea". In form it was somewhat flattened, and presented irregularities on its surface which resembled lobular divisions. In consistency it was firm but not hard, and the color was yellowish gray. It was not connected in any way with the sclera. Under chloroform anesthesia it was excised with scissors and forceps, and did not recur.

Prudden* also records a case which was removed from the inner canthus of the left eye in a female 74 years of age. The growth had been increasing slowly in size for seven years without causing any pain or inconvenience. It had its origin in the caruncle.

Von Graefe,† under the name of hypertrophy of the caruncle, reports a case in a boy 10 years of age. The tumor gradually increased in size until it was about half as large as a hazel nut. It was decidedly red in appearance, with spots of yellow on the surface. Examination with the loupe showed numerous small openings, which were obviously of a glandular nature. There were also very fine hairs upon its surface. The tumor was removed by dissection.

To these cases the writer desires to add the following:

Mrs. Blank, a widow, aged 57 years, consulted me in the latter part of 1900 for the purpose of having her refractive error corrected. After this had been done she directed my attention to a minute bluish-red spot, about the size of a pin's head, situated in the right lachrymal caruncle. It lay beneath the surface, the caruncular tissue over-lying it being translucent, was slightly ovoid in shape, and presented the external appearance of a minute angioma. No family history of tumors of any kind could be elicited. Beyond a very moderate conjunctival irritation at times, no symptoms were ocassioned by its pres-

*Arch. of Ophthal., Vol. XVI, 1886. 1.

†Arch. f. Ophthalmologie, Vol. 1, p. 290.

ence. It was readily removed by forceps and scissors under cocain anesthesia and given to Dr. E. A. Shumway for microscopical examination, who reported as follows:

"Microscopical examination reveals an oval, well circumscribed nodule embedded within the caruncle, measuring 1.4 x 1 mm. in diameter, in the celloidin sections. The nodule is composed of a convoluted mass of tubular gland acini, each of which possesses a distinct basement membrane, lined with tall, narrow, columnar, epithelial cells. The nuclei are oval, and are situatad at about the middle of the cell; the protoplasm surrounding the nucleus is granular, and sections passing at right angles to the long axes of the cells show that in cross section they have a pentagonal outline. At irregular intervals there are interposed, between them and the basement membrane, flattened polymorphous cells, with well staining nuclei. The contiguous acini are in close apposition, their basement membranes being separated only by a small amount of connective tissue, which carries thin walled bloodvessels and contains a few flattened connective tissue cells and a moderate number of round cells. Many of the acini have a narrow lumen, but most of them are widely dilated and show a tendency to cyst formation. They contain a fluid, loosely coagulated into small drops, which stains faintly with the eosin. Some of the more widely dilated acini contain, in addition, a denser, amorphous exudate in which the debris of cast-off cells may be recognized. The acini are everywhere regular, and there is no breaking through of the basement membranes by the lining cells, nor infiltration of the surrounding tissues. At one end of the caruncle there are cross sections of circular tubules, lined with cuboidal cells, which have the appearance of excretory ducts. The nodule has no distinct capsule, although the surrounding connective tissue has been so condensed by its growth as to suggest such a structure. The caruncle shows a moderate round cell infiltration, especially around the minute hair follicles and the sebaceous glands. The surface epithelium is thickened and contains numerous goblet cells. There is no trace of the compound tubular gland (accessory lachrymal

gland—Panas, Terson; modified sweat gland—Waldeyer) which is commonly present, and despite the difference in the form of the lining epithelium, it seems probable that the new growth has developed from this structure.

"The growth is then a benign *cystic adenoma (cyst-adenoma)* of the caruncle developing from the tubular glands in this position."

A CLINICAL AND HISTOLOGICAL STUDY OF A CASE OF MELANO-SARCOMA OF THE CHORIOID.

By Frederick Krauss, M. D.,

PHILADELPHIA.

Mrs. W., aged 35 years, called at my office for the first time on July 29, 1899, complaining of pain and of impaired vision in her right eye.

She stated that she had been struck in that eye four months ago by the flying of a piece of wood that she had attempted to break with a hatchet. The eye at once became red and painful, for which condition she was treated at a local eye dispensary. The vision ever since has been poor in spite of continued treatment at the eye dispensary and by her family physician. She now complains of very great pain and inability to see with the right eye. Her family history is entirely negative. The patient says she had no trouble with either eye until the above accident occurred.

Present condition:—The corneæ of both eyes are clear, the pupils are oval, 3 mm. in diameter, the left iris responding freely to light, accommodation and convergence. The pupil of the right eye is sluggish, but responds freely when exposed consensually. The eyes are quiet. The tension of the right eye is somewhat diminished; the anterior chamber is shallow.

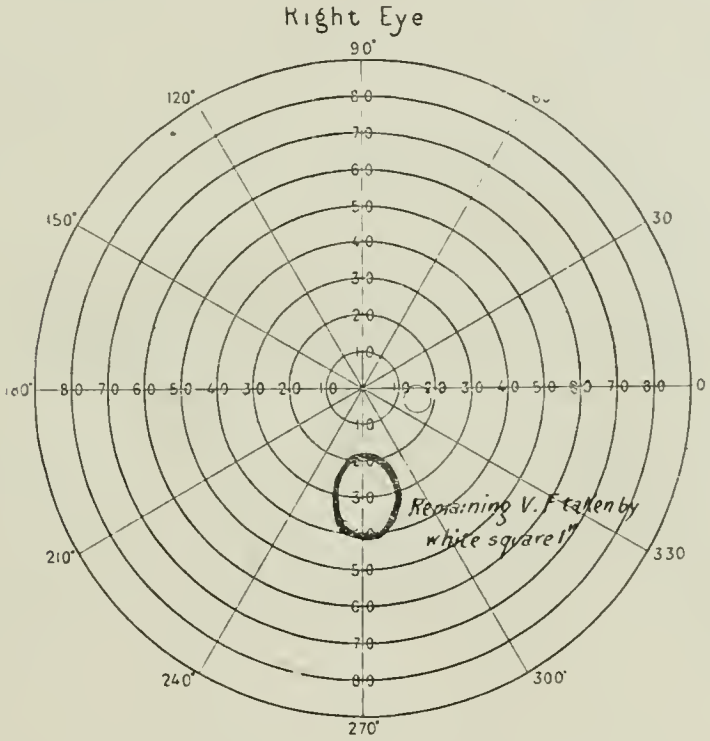
The vision of the right eye is limited to a small excentric area of light perception directly below the middle of the field, as indicated upon the accompanying chart. In this position a small piece of white paper, 2 centimeters in diameter could be distinguished. (See Fig.)

In the left eye the vision, accommodation and the form field are normal. The eyeground is normal, except that the disc is too reddish in tint (superficially overcapillary).

Ophthalmoscopically, the right lens appears hazy in its lower section, otherwise the media are clear. A large growth occupies two thirds of the visible area of the fundus,

and is best seen with + 20 D. It is bright red in color, very richly supplied with bloodvessels which run over the exposed surface. Above and slightly anterior to the growth, on both sides, are small bluish white saccules of detached retina loosely filled with thin fluid. These saccules move freely when the eye is turned.

The pupil dilates fully and evenly with homatropine. The growth is seen to have an irregular surface, and is pressed against the posterior capsule of the lens below. Numerous vessels of the size of a main branch of the



retinal artery run over the surface. The bluish white sacs of retinal detachments are seen above.

A diagnosis of sarcoma of the chorioid was given and enucleation advised. Consultation with Dr. W. C. Posey confirmed the diagnosis, and on Aug. 15, 1899, I removed the eyeball under ether, with no accidents. The socket healed normally, allowing the adjustment of an artificial eye. There has been no recurrence up to the present date, Feb., 1902.

The left eye is absolutely emmetropic. The enucleated eyeball was immediately placed in in Mueller's hardening fluid, and afterward in alcohol. Microscopic sections

were made for me by Dr. Edward A. Shumway, of the Polyclinic Laboratories.

Macroscopically, the lens is seen pressed forward almost against the cornea; the pupil is widely dilated and the retina is detached. On the temporal side there is a tumor mass extending from a point directly posterior to the ciliary body, to a point beyond the median line, and 6 mm. from the papilla. The anterior and posterior margins are apparently the only parts pigmented.

Microscopically the cornea and lens appear to be normal. The anterior chamber is shallow but its angles are free. The iris is filled with a homogeneous exudate similar to that also found in the subretinal spaces. The retina is detached and pushed forward to a point immediately behind the ciliary processes. The ganglion cells and the rods and cones are completely destroyed. The optic nerve is partially atrophic.

The tumor mass arises from the chorioid, and is made up exclusively of spindle shaped cells, the nuclei of which fill up the greater part of the cells. The cells are arranged in bundles. The central part of the mass shows but a few scattered pigment cells, while the scleral, anterior and posterior borders are lined with densely pigmented cells. There are no large bloodvessels in the tumor mass, the blood being supplied by fine capillaries running between the bundles of cells. The sclera has not apparently been invaded.

PATHOGENESIS OF GLAUCOMA.

By Dr. M. Uribe Tróncoso,

CITY OF MEXICO, MEXICO,

TRANSLATED BY

Dr. Albert B. Hale,

CHICAGO, ILL.

From the time of Mackenzie and v. Graefe, who restricted the nosological picture of glaucoma to its characteristic manifestation in increased tension, up to Schnabel, who saw in this symptom nothing but the result of a glaucomatous neuritis, there have been innumerable theories to explain the essential cause of the disease; but it must be confessed that up till now none of these is fully satisfactory. Anatomical or pathological investigation, although they have no doubt contributed to elaborate our knowledge of the way in which certain symptoms are caused, nevertheless, have not advanced us one step in the knowledge of etiology.

The discovery of Knies marked a new stage in the history of glaucoma, and the demonstration of the adhesion of the iris to the filtration angle was the point at which new horizons were opened to our investigation; but all our hopes seem to have fallen to earth before the fact that this adhesion does not necessarily exist in acute inflammatory glaucoma and that this should, therefore, be truly considered not so much the cause as rather the effect of the hypertension.

We have been obliged, therefore, to return to the older theory of serous chorioiditis of v. Graefe (the theory of hypersecretion) since the retention theory was not sufficient to explain the primitive phenomena. There are other theories, such as that of Donders, which attributes to the trigeminus a neuro-secretory cause for this increased tension, and that of Abadie, which attributes the

increased tension to the vaso-dilator fibres of the sympathetic.

But all these observers have occupied themselves exclusively in examining the quantity of fluids secreted within the eye for the cause of this increased tension; no one seems to have studied the *quality* of this fluid or the way in which it may be influenced under pathological conditions. There, where the filtration of the aqueous humor into the anterior chamber takes place, is to be found the explanation of the process, and in studying this it is easy to follow from its origin the production of all those symptoms which present themselves successively in primary glaucoma and the exact pathogenesis of the various forms of secondary glaucoma.

I have decided, therefore, to pursue my own study in the following stages:

1. Primitive or essential glaucoma;
2. The effect of iridectomy;
3. Chronic simple glaucoma;
4. Secondary glaucoma;
5. Experimental glaucoma.

1. Primary Glaucoma. Since Birnbacher, Elschnig, Fuchs and Rochon-Duvigneaud (Panas and Rochon-Duvigneaud, Recherches anatomiques et cliniques sur le glaucome et les neoplasmes intraoculares, Paris, 1898) who made post-mortem studies of eyes destroyed by acute inflammatory glaucoma, it is a well established fact that the angle of the anterior chamber preserves its integrity and that the iritic adhesion of Knies is lacking, at least at the beginning of the attack. The increase in the volume of the intra-ocular fluid has been, nevertheless, demonstrated, but since the lesions of serous chorioiditis as a cause of hyper-secretion have never been found, it is necessary to explain the retention by other factors which may impede exosmosis of aqueous into the canal of Schlemm. Convinced as I was that some alteration in the aqueous was accountable for a glaucomatous condition, I began to remove this liquid from all glaucomatous eyes which I treated and had it analyzed chemically; I found, as I had hoped, a notable increase in all cases of the

albumenoid constituents as compared with normal eyes or to others suffering from conditions not glaucomatous.

[The author has here given a detailed account of his methods of conducting this examination which will be found in the Anales de Oftalmologia, October, 1901.]

Such an increase of albumen—a colloid substance—influences to a noticeable extent the filtration of the aqueous which is purely a phenomenon of exosmosis as Rochon-Duvigneaud has shown.

The chemical analysis of the aqueous was made in 19 cases of inflammatory glaucoma. Of course with such a small quantity of fluid as is contained in the anterior chamber it was a difficult task to devise any exact method to measure the density or to determine the exact proportion of each one of its constituents, but Dr. Fredrico Villasenor, chemist to the National Medical Institute of Mexico, was able to accomplish this very successfully.

[The author gives in a foot note the methods devised by Villasenor and Prof. Lozano y Castro for analyzing the aqueous. These methods may be studied in detail in the Anales de Oftalmologia, October, 1901.]

The composition of normal aqueous humor is, according to Berzelius:

Water	98.10
Chlorid of Sodium	1.15
Substances soluble in water	0.75
" " alcohol	traces
Albumen	"

According to Lohmeyer it is, for spec. grav. of 1.0053:

Water	986.87
Solids	13.13
Proteids	1.22
Extracts	4.21
Inorganic salts (chlorid of sodium 6.89)	7.70

With the object of comparing with these figures results obtained from normal eyes in Mexico, Dr. Villasenor analyzed the aqueous from a man of 32 on whom an operation was performed to remove foreign bodies from the cornea (0.2004 cc. used):

Density at 18° Cent. 1.012.

Water	98.8024
Mineral constituents	0.4990
Organic "	0.6986

Prof. Lozano y Castro obtained these results from a man of 26:

Density at 20° C. 1.0075.

Water	98.2717
Mineral constituents	1.2345
Organic	0.4938

PATHOLOGIC AQUEOUS HUMOR.

A. Glaucomatous Eyes.

Observation I. Typical acute glaucoma in a man 37 years old. The aqueous was much less fluid than normal. Analysis resulted as follows:

Density	1.022
Water	96.096
Mineral constituents	1.463
Organic "	2.439

Observation II. Chronic inflammatory glaucoma in a man 45 years old. Analysis as follows:

Density at 18° Cent.	1.0145
Water	97.9568
Mineral constituents	0.6610
Organic "	1.3822

Observation III. Subacute glaucoma in a man 33 years old:

Density	1.005
Water	98.412
Mineral Constituents	0.515
Organic "	1.071

Observation IV. Chronic inflammatory glaucoma with acute exacerbation. Woman 69 years old. The aqueous was less clear than the preceding and of a dirty yellow color:

Water	95.977
Mineral constituents	0.431
Organic "	3.592

Observation V. Absolute glaucoma in a man of 60, both eyes:

Left eye.

Water	96.520
Mineral constituents	1.136
Organic "	2.338

Aqueous reproduced 15 minutes later.

Water	97.185
Mineral constituents	0.469
Organic "	2.346

Right eye.

Water	98.437
Mineral constituents	0.781
Organic "	0.782

Aqueous reproduced 15 minutes later.

Water	96.692
Mineral constituents	0.923
Organic "	2.385

These analyses may not be perfect as the fluid had to be preserved five days, owing to the absence of Dr. Villasenor.

Several days later the aqueous was again withdrawn from this right eye with the following result:

Density at 18° C.	1.0175
Water	96.8912
Mineral constituents	1.6580
Organic "	1.4508

Observation VI. Acute glaucoma in the left eye; absolute glaucoma in the right eye. Woman 70 years old. Analysis as follows:

Right eye.

Density at 19° C.	1.013
Water	95.7799
Mineral constituents	0.3669
Organic "	3.8532
Quantity removed	0.0545

Aqueous reproduced.

Density at 19° C.	1.012
Water	97.6151
Mineral constituents	0.2803
Organic "	2.1046
Quantity removed	0.0717

Left eye.

Only the reproduced aqueous (0.0938) was examined.

Density at 13°.	1.0085
Water	97.9744
Mineral constituents	0.4264
Organic "	1.5992

Observation VII. Acute glaucoma in both eyes. Woman of 55 years:

Density at 18° C.	1.006
Water	96.622
Mineral constituents	1.697
Organic "	2.681
Quantity removed	0.1119

Aqueous reproduced.

Density at 19° C.	1.0065
Water	98.019
Mineral constituents	1.289
Organic "	0.692
Quantity removed	0.0858

An interesting point in this case was the appearance after the iridectomy of the opacity of the lens, not due, as it might seem, to traumatism either at the time of puncture nor when making the excision of the iris. Moreover, in spite of complete cicatrization of the corneal wound, the anterior chamber did not reform, but the lens remained adherent to the posterior surface of the cornea.

Observation VIII. Acute glaucoma. Vitreous hemorrhage. Male, 32. Analysis of aqueous from the right eye. The color was yellower than in any of the previous cases:

Density at 14° C.	1.006
Water	97.2458
Mineral constituents	0.6356
Organic "	2.1186
Quantity removed	0.2360

Aqueous reproduced.

Density at 15° C.	1.0065
Water	98.7949
Mineral constituents	0.4273
Organic "	2.7778
Quantity removed	0.0936

In all these earlier analyses we expected to discover the nature of the organic constituents in aqueous humor, but, in view of the small quantity of fluid obtained (3 to 4 drops) it was necessary to use for this purpose *all* the fluid obtained from the left eye of the patient subjected to the following investigation. In all analyses of glaucomatous aqueous, since it was not possible to measure the

albumen accurately, its presence was undoubtedly determined by the recognized reactions.

Observation IX. Chronic inflammatory glaucoma with acute outbreak. Woman, 78. Aqueous from lèft eye, light colored, oleaginous, responding readily to all tests for albumen, and yielding (method of Brandberg) 0.3 per cent. of albumen.

Reproduced aqueous was still more oleaginous and showed a slight spontaneously formed coagulum, 0.85 per cent. of albumen. No fibrin was found in either of these two specimens.

B. Other Diseases.

Observation X. Rheumatic iridochorioiditis. Woman 58 years. Analysis gave:

Density at 19° C.	1.009
Water	99.800
Mineral constituents	0.0174
Organic "	0.1826
Quantity removed	0.115

Observation XI. Interstitial keratitis. Girl, 14. Aqueous. Analysis gave:

Density at 20° C.	1.000
Water	97.172
Mineral constituents	1.285
Organic "	1.533
Quantity removed	1.945

Aqueous reproduced.

Density at 20° C.	1.000
Water	96.252
Mineral constituents	1.788
Organic "	1.960

Observation XII. Iritis serosa. Male, 57, Right eye bad for 15 days, when a corneal ulcer was discovered; deep anterior chamber; deposits on Descemet's membrane; semidilated pupil, yielding slowly to atropin but showing some posterior synechiæ; turbid vitreous; plus tension. The aqueous showed fibrin in large quantities and 0.35 per cent. of albumen.

Observation XIII. Senile cataract. Woman, 46. Pupil and anterior chamber normal. Analysis showed, organic aqueous:

Density at 14° C.	1.0001
Water	97.5222
Mineral constituents	2.0330
Organic "	0.4448
Quantity removed	0.1574

Aqueous reproduced.

Density at 12° C.	0.996
Water	94.9669
Mineral constituents	2.9139
Organic "	2.1192

Resumè. In 19 analyses of glaucomatous aqueous the density varied from 1.005.50 to 1.022 higher than reported by Berzelius in physiologic aqueous (1.005) and than that obtained in Mexico by Profs. Villasenor and Lozano, which were 1.012 and 1.007. They were higher also than that obtained in cases of interstitial keratitis and cataract, in which the density was exactly that of water or a little less. The maximum density of 1.022 is much different from that of 1.009 which was found in rheumatic iridochorioiditis.

The quantity of mineral salts varied from 0.36 in simple aqueous or 0.28 as the lowest proportion, and 1.68 as the highest, in contrast to those of 0.49 and 1.23 in physiologic aqueous or to those of 0.01 in iridochorioiditis and 2.91 in senile cataract. As far as concerns the proportion of organic ingredients the lowest result was 0.78 in simple aqueous as contrasted with that of 0.69 and 0.49 in physiologic aqueous. The maximum was 3.85. In serous iritis the proportion 0.35 was somewhat greater than that of 0.30 found in the case of glaucoma. In interstitial keratitis also there was a notable increase over the physiologic quantities. In cataract this quantity of albumenoid constituent was found only in newly-formed aqueous. In contrast to what other authors declare, new formed aqueous did not coagulate and only once did we see a small coagulum form spontaneously. In this, as well as in glaucomatous aqueous the quantity of organic matter was no more uniform in newly produced aqueous than in glaucomatous aqueous. There were noticeable variations showing that the permeability of the vessels and condition of their walls were affected by the composition of the fluid. These figures which represent the composition of the aqueous in these eyes should not be taken as absolute

values. They indicate not only the degree of the vascular lesions and the state of the disease but they must show the condition of nutrition in each eye through their greater or less influence on excretion and on the permeability of the vessel wall. Chemical analysis of the aqueous gives us important data and I think is of great service in helping recognize the state of nutrition of an eye and in opening a new field for the study of certain classes of disease wrapped in obscurity.

Hypertension and Glaucoma. The constancy and result obtained in my analyses, as far as concerns the organic constituents in the aqueous of glaucomatous eyes, allows me to state that hypertension is a symptom subordinate to the difficulty of exosmosis when a liquid is more albuminous than the normal. Hypertension is, of course, only a symptom common to a number of diseases, while glaucoma is a disease by itself. Hypertension is produced in two distinct ways:

1. By increased difficulty in excretion of aqueous loaded with albumen. 2. Mechanically, by adhesion of the root of the iris to the sclero-corneal junction.

The albumenoid constituents may come from two sources entirely distinct and they form two groups also entirely distinct: (1) either the result of an inflammatory process within the anterior segment of the eye which loads the aqueous with fibrin, exudate, etc.; or (2) as in glaucoma in which albumen is almost exclusively present, they result from some vascular disturbance similar to that seen in interstitial nephritis.

There must be added a third form of hypertension produced by an increase in the quantity of the aqueous when secreted under increased blood supply, but if the filtration process is normal, increase of pressure can be neutralized by increase of excretion and the equilibrium is soon established. It is probable that in certain inflammatory conditions in the front of the eye the quantity of the aqueous secreted may be greater than normal, as in iridocyclitis serosa where the depth of the anterior chamber is exaggerated, but this must be ascribed rather to the mechanism of retention than to hypersecretion itself.

In glaucoma the quantity of aqueous within the anterior chamber is, on the contrary, much less than normal. The

shallowness of the anterior chamber, easily seen on examination, demonstrates a fact which our measurements have already proven; that is, in our experiments this quantity varied from 5 to 23 centigrams, whereas in the normal state there were 30 to 35 centigrams, according to Petit or 40 to 45 according to Sappey. Even admitting that I did not extract all of the aqueous, these figures are too wide apart to admit of any discussion.

Neglecting for the moment hypertension due to inflammation or to mechanical retention, let us study the conditions accompanying simple glaucoma, where it is seen that hypertension is not only the characteristic but even the essential mark of the disease. In a normal state the vessels of the ciliary body and iris do not allow the albumen of the blood to pass through them but when the vessels are altered it may pass through them into the anterior chamber. Lesions of the epithelium of the pars ciliaris retinæ separating the network of the ciliary vessels from the posterior chamber, must have a certain influence on the production of dialbuminosis. This results in the eye through a mechanism similar to that in interstitial keratitis.

Pathologic investigations on the eye have shown the frequency and gravity of alterations of the blood vessels. These are principally lesions in senile arterial sclerosis, in endovasculitis, which are found in the vessels of the iris, ciliary body and retina. Ulrich, in 1882, described as hyaline degeneration lesions characterized by narrowness of the caliber of the arteries of the iris and by dilatation with weakness of the vessel walls. Schnabel found the same lesions more or less generally distributed to other vessels of the eye. Brailey has demonstrated dilatation in the great arterial circle of the iris and of the ciliary body. Elschnig showed in a case of acute glaucoma dilatation of ciliary vessels which were full of blood. In some cases the capillaries were seen to have very thin walls with few nucleated cells. In hemorrhagic glaucoma this arterial sclerosis reached its maximum. Rochon-Duvigneaud found that the vessels of the ciliary body were notably dilated, while those of the iris were atrophic and with a hyaline thickening of its walls which soon led to obliteration. I attribute these lesions of the vessels, as

well as those of the stroma of the iris, to the adhesion of this membrane at the filtration angle and I consider this independent of the lesions of the ciliary or chorioidal vessels. Rosa Kerschbaumer says she has found sclerotic vessels and thickened stroma in the ciliary processes. Kuhnt and Haab state that the endarteritis of the chorioidal vessels constitutes the most frequent lesion in glaucoma. Hache and Hulke have demonstrated the constancy of arterial sclerosis, of aneurism, and of endarteritis in hemorrhagic glaucoma. The arteries of the retina, according to Panas and Rochon-Duvigneaud are the seat of an endarteritis. They insist on the constancy of this lesion as opposed to any affection of the chorioidal vessels. They call it an elective or systematic process. Even the veins of the retina do not escape but are often the seat of a periplebitis which increases their narrowness. As far as the lesions of the veins of the uvea are concerned, Birnbacher and Czermak have found cellular infiltrations around the veins of the chorioid, which they think are constantly and completely inflamed in glaucoma. They show, moreover, a periphlebitis and an endophlebitis of the vorticose veins which produces intraocular venous stasis. Alterations of the epithelium of the ciliary body have not been particularly noticed because the attention of students has not been especially called to this point. Nevertheless, in a case of acute glaucoma Elschnig found the epithelium much altered.

The production of aqueous being principally a phenomenon of excretion can be compared to the process which takes place from the epithelium of the renal tubuli.

From all these data of pathologic anatomy which we give here, it would seem the changes in the vessel-wall constitute one of the most principal and characteristic lesions in glaucoma. These lesions suffice to explain the passage of albumen from the blood of the aqueous. Arteriosclerosis of the vessels of the uveal tract and of the retina induces a narrowing of their caliber and causes a condition which may be called ocular dialbuminosis. As is well known movement of albumen through the vessel wall depends largely upon the slowness of the blood stream, a slowness which in this case is produced by the roughening of the epithelium of the inflamed vessels (impulse of

the blood remaining the same) which has as a consequence a reduction of arterial pressure and an increase in venous pressure, conditions which as Stokvis and Runeberg say are most favorable for the filtration of albumen. The nervous system also must play a great part in the production of dialbuminosis. Dilatation diminishes arterial pressure and slows the blood stream, thus permitting egress of substances which in a normal state would be retained within the vessel. Thus may be explained the influence which some emotion or shock has upon the precipitation of glaucoma and confirmed the effect which Abadie says the sympathetic exercises in the production of glaucoma.

From all that has been said I think I have proved that hypertension in glaucoma results from a different exosmosis of aqueous which has thereby become more albuminous than normal and in which vascular sclerosis is a principal factor. Let us now study the symptoms of glaucoma in the light of our new theory based on clinical facts.

GENESIS OF GLAUCOMA.

The retention of aqueous in the anterior chamber sufficient to explain hypertension is, however, not enough itself to be called glaucoma. This alone would not produce diminution of depth of the anterior chamber nor a scant quantity of aqueous, since in serous iritis hypertonicity is accompanied by an increase of the anterior chamber with retrocession of the iris and since iritis itself sometimes ends in true glaucoma, although its usual termination is in atrophy. The difference lies essentially in the involvement of the vitreous. The shallowness of the anterior chamber is due to an advance of the lens and iris produced by a kind of edema, an increase in the quantity of vitreous. It is a well known clinical fact that in certain malignant glaucomas after iridectomy the anterior chamber is not restored at all, but, nevertheless, intraocular tension is raised. This happened in case 7 where the lens and iris were close against the back of the cornea and where the tension remained high in spite of iridectomy. In case 2 after puncture, the anterior chamber was not filled for

two or three days but in spite of this, tension did not diminish. In the same way posterior sclerotomy, which allowed vitreous to escape, was able to cut short an attack of glaucoma although not a drop of aqueous was lost.

Increase in the amount of vitreous is one of the most characteristic signs of glaucoma and depends not only upon the impregnation of all the tissues by the fluid retained during the attack but also and principally upon the escape of albumen through the retinal vessels. According to Panas and Rochon-Duvigneaud endarteritis of the retinal vessels is an elective systematic process. All the conditions necessary for the escape of albumen, such as we have mentioned before, and such as are found here as well as in the vessels of the ciliary body, must aid in changing the character of the vitreous. The investigations of Panas concerning napthalin cataract (Archives d'Ophtalmologie, Tom. VIII, 1887) seemed to demonstrate the great trophic influence of the retinal vessels on the vitreous. Embryologically, these vessels belong to the vitreous from which they are separated by a hardly distinguishable membrane. During all of the intrauterine life the vitreous and the lens are nourished by the hyaloid artery, but in the adult the nutrition of the vitreous depends solely upon the retinal vessels. The aqueous is an excreted fluid, poor in albumen, whose principal function is to fill the anterior chamber and to allow the free movement of the iris diaphragm. Although the anatomy and physiology of the vitreous are as yet but imperfectly understood we do have some facts to support this opinion.

As Panas has said, in the eye, as in all the organs of the body, nutrition must come from the blood vessels. The existence of a nutritive stream which arises from the retina and flows forward seems proven by the following:

1. It is not unusual to find, in the histologic structures of the normal eye, between the hyaloid and retina, spaces full of coagulated lymph which proves the existence of a subhyaloid fluid.

2. In the superficial coverings of the adult vitreous, principally about the papilla and the ciliary body are encountered a great number of flattened cells with one or two nuclei and formed of granulated protoplasm which

Schwab shows to be only migrated leucocytes from the retinal vessels.

3. This structure of the vitreous, composed of stratified layers radiating from the canal of Cloquet, speaks in favor of a circulation of fluid toward the interior of this body.

4. In old age, the leucocytes of the superficial layers of the vitreous diminish notably—a proof that nutrition, also, is then impaired.

If then the normal structure of the plasma escaping from the vascular walls is choked in glaucoma, filtration through the alveoli—osmosis—must change in such proportion as to effect profound changes in the composition of the vitreous.

The changes have been already suggested by other writers who have found in advanced cases the vitreous quite soft. Haensell (Archives d'Ophtalmologie, 1890, p. 518) especially has studied the condition. He says: "I found an equatorial zone in the vitreous in which was a glossy network arranged concentrically around Cloquet's canal within which was a homogenous mass coagulating into an albuminous substance that could be separated by gentle washing in water." "Under the microscope the vitreous layers and the fibres uniting them seem formed of a hyaline structureless substance that reacted to staining agents just as did the hyaline substance of the vitreous in the embryo or adult." "In the vitreous of eyes in which glaucoma had been of only short duration the lamellæ could be demonstrated still surrounded by normal vitreous and blending insensibly into it." The same author found an intracellular network in the cellules of normal vitreous which are represented in the newborn by a granular liquid, the last vestige of embryonic blood. In the adult this becomes a homogenous, colorless liquid having the same refractive index as the lens. In glaucoma, the intracellular spaces are completely closed by a thickening of the hyaline substance of the cells, and these contents are forced to accumulate between the lamellæ where, not finding exit, they stagnate. This accounts for the increased size of the vitreous.

In a case of hemorrhagic glaucoma reported by W. Campbell Posey (Transactions, Section of Ophthalmology, Amer. Med. Assn., 1900) the anterior chamber was found

full of a homogenous liquid extending to the posterior chamber, which occupied the space between the fibers at the zonula and was continued even to the vitreous.

Rochon-Duvigneaud, in a similar case, found, on opening the globe "the vitreous separated from the posterior pole, and even impregnated by a yellowish liquid which, on standing, deposited a yellowish coagulum."

The investigations of Haensel have attracted too little notice, because in them an essential note was missing: a full explanation as to the nature of the causative factor. My own theory is the only one that can explain these phenomena with a satisfactory clearness.

Admitting the evident role of the vitreous in glaucoma, all the symptoms are readily understood and united. Either as the result of a senile arteriosclerosis, of an arthritis, gout, etc., as a result of a localized endarteritis within the eyeball, the vessel walls become permeable to the albumen which, mixed with the contents of the anterior chamber, retard the proper filtration at the filtration angle. When the secretion of the albumen reaches a certain degree the excretory passages still intact become insufficient, the intraocular tension rises until the augmentation of new aqueous equalizes the tension within the vessels, when secretion of aqueous is checked. Somewhat before this the first symptoms of glaucoma appear: the edema of the cornea, the moderate dilation of the iris, the swelling of the retinal veins, the arterial pulsation, the periodic reduction of vision, the periorbital pains, etc., all phenomena dependent upon increased intraocular tension and venous stasis.

Such attacks are nearly always associated with some mental emotion, a reflex congestion of the veins of the head, with insomnia, etc., producing a vasomotor dilation showing itself chiefly in the vessels of the ciliary body. These disturbances disappear with the causes that produce them. the albumen disappears from the aqueous and excretion is re-established; but when they reappear they become severer, the vascular disturbance progresses by degrees till suddenly an acute attack of glaucoma breaks out. The amount of albumen secreted reaching a higher degree than during the prodromes, rapidly inhibits filtration and tension rises with a bound; the veins are compressed

at their exit and an intense congestion is produced in all the tissues of the eyeball accompanied by a mild diapedesis (Knies). The cornea is infiltrated and becomes turbid, the iris is edematous, its normal appearance is lost, its veins are dilated and tortuous; the uvea is copiously infiltrated. (Stölting. Operative Treatment of Glaucoma. Annals of Ophthalmology, 1898, p. 62. "The experimental ligature of the vorticose veins gives rise to circulatory disturbances the effect of which, on the eye tissues, is much the same as that of acute glaucoma.) The vitreous, with its nutrition already affected, swells, presses forward the iris and the lens, thus adding a new factor to encourage retention. As the vitreous crowds forward, the anterior chamber is made smaller and the root of the iris is pushed closer to the sclerocorneal junction. The effect of edema of the vitreous is well expressed in Elschnig's studies on acute glaucoma—quoted by Panas and Rochon-Duvigneaud: "The root of the iris is pushed forward and outward in such a way that the iris covers the anterior face of the ciliary body which forms the vertex of the anterior chamber, and touches the pectinate ligament at least at its origin. The result is that the circular fibers of Mueller's muscle are dragged forward from the normal position, as are also the anterior roots of the ciliary processes. The canal of Schlemm is lacking over the entire area in which the iris is against the pectinate ligament. The posterior chamber is increased." Again: "The anterior chamber was flattened, but although the root of the iris was crowded forward, the angle of the anterior chamber was pressed and the iris did not touch the pectinate ligament. The ciliary processes also crowded forward, were of excessive size and nearly touched the iris. At one point in the anterior chamber the root of the iris seemed to be pressed so far forward as to touch the cornea."

The increase in volume of the vitreous must, in reality, cause all the phenomena, acting as it does equally upon ciliary processes, posterior chamber and lens—or the diaphragm.

Priestley Smith has experimentally shown the closure of the filtration angle and the suppression of filtration when vitreous pressure rises above that of the anterior chamber.

This was done by the means of two hollow needles one, placed in the anterior chamber and the other in the vitreous of a lamb's eye, the other extremities connected by a rubber tube with a small glass vessel full of water tinted black. When both tubes were at the same height above the eye (30 cm.) pressure was equal in both chambers and the fluid filtered away from the anterior chamber, injecting the episcleral veins and escaping to the surface, but if the needle in the vitreous had its end raised, thus increasing the pressure within the aqueous, filtration was retarded. In the frozen eye it was shown that the anterior chamber was diminished and that the lens and iris had been crowded forward till the root of the iris lay against the sclerocorneal angle. (Ophthalmic Record, 1894.)

If, in an acute attack, retention is produced by the two mechanisms mentioned, it will last as long as the circulatory disturbances which caused the escape of albumen from the vessels. As in the kidney, this albumen is intermittent, it diminishes or ceases before and after the attacks, but when after recurring, it tends to become permanent. After several attacks the vitreous does not again become normal; the root of the iris remains pressed against the sclerocorneal edge, and, with the irritation from the albumen abnormally present, tends to bring about the adhesion of Knies. Influenced by the albumen all the tissues bathed in aqueous suffer what may be called a chronic fibrous sclerosis—like chronic endarteritis. A fine fibrous translucent membrane is formed covering the anterior surface of the iris, the pupil, the sclerocorneal edge, the meshes of which it fills, and extends over the surface of Descemet's membrane. We shall see later, in the chapter on experimental glaucoma, how this may be experimentally produced.

This albumen irritates the deeper tissues as well, particularly the papilla, producing congestion and inflammation before the excavation appears.

In subacute and chronic glaucoma all these phenomena are produced slowly. As the quantity of albumen secreted is less, filtration is checked, but not inhibited. In the vitreous the nutritive fluid secreted by the retinal vessels contains more albumen than the normal and disturbs

vision; diffusion circles are produced. Stagnation takes place and causes increase in volume and those structural alterations of which we have already spoken. Nuel and Benoit (Belgian Ophthalmological Society, April, 1899) have shown that in the human eye there is no filtration through the optic nerve, since all fluids pass forward from the vitreous to the aqueous and pass out by Schlemm's canal or are absorbed by the vessels on the anterior surface of the iris.

If iridectomy is not performed the root of the iris is in the end permanently adherent to the filtration angle. There then occurs an adhesive inflammation which means the eye's destruction. If the filtration angle is obstructed there remain only the iris vessels through which absorption can take place, but these suffer also in the pressure process and become less and less able to perform service. Excretion once suppressed, absolute glaucoma supervenes. And, as our analyses show, the quantity of albumen is now even greater than in the acute stage. The entire globe arrives at a stage of atrophy, discoloration of the iris, etc.; the optic nerve, which from the beginning of the attack was congested, or, according to Brailey and Edmunds, inflamed, yields to the increased tension, is excavated, and atrophies. The eye is finally disorganized, the sclerotic shows anterior staphylomata, etc.

In hemorrhagic glaucoma all authors agree as to the importance of recognizing these vascular lesions. For a long time it was disputed whether the hemorrhage was the cause of the glaucoma, or vice versa, or whether there was a general cause for both. Against the former idea are brought forward those cases of retinal hemorrhage that are unaccompanied by glaucoma. In favor of the second, are given the frequency of the arteriosclerosis, the proliferating endarteritis, thrombosis and embolism of the retinal vessels, aneurysms of the arterioles, and venous varices.

Hemorrhagic glaucoma is nothing else than congestive glaucoma in which all the phenomena are of maximum intensity. The deep seated disease of the retinal vessels causes both the hemorrhages and the escape of albumen. At the commencement of these changes there is, says Thoma, a tendency to rupture of the arterioles, since they

become tortuous and lose their elasticity; afterward, this danger may disappear because of the deposit of an adhesive web which makes the internal tunic firmer and rigid. In some cases there must be borne in mind the presence of aneurysms, in others that of multiple emboli and thrombosis of the retinal vessels. Hemorrhages from the retina have often been the percusor of cerebral hemorrhages—a general arteriosclerosis.

The intensity and gravity of the attack in hemorrhagic glaucoma stand in due relation to the quantity of albumen excreted at any given moment; filtration is rapidly obstructed; the vitreous, disturbed in its nutrition, increases in volume and the eye incapable of eliminating so much albumen, soon reaches the stage of absolute glaucoma.

If in simple glaucoma these hemorrhages do not—in spite of arteriosclerosis—occur, the lesions are merely not grave or extensive enough, and there have not been formed those thrombi or emboli which are probably the cause of the extravasations.

CHAPTER 2.

Effect of Iridectomy, other Operations, and Mi tics n Inflammatory Glaucoma.

Since v. Graefe's day, numerous theories have been propounded to explain the effect of excision of a piece of the iris. All have naturally been influenced by that author's ideas as to the cause, and they all have the defects of that argument. With the new conception which I advocate, the result of iridectomy is easy to understand and to interpret. Simple incision of the globe is a good means of reducing tension, releasing not only the aqueous charged with albumen, but also the albuminous precipitates formed within the anterior chamber, and also allowing the new aqueous quicker escape through Schlemm's canal and the iris vessels. As ocular dialbuminosis is by nature of only a transitory character at first, it is plain that one or more punctures may completely overcome an attack of glaucoma—as v. Graefe observed—or may at least restrain it, but when the albumen is reproduced,

there are repeated the conditions that delayed filtration, because the effect of paracentesis is exhausted.

Excision of part of the iris has a more lasting and secure effect. In acute glaucoma it is most serviceable where pressure of vitreous has mechanically crowded the root of the iris against the filtration angle before inflammatory adhesions are firmly formed. Slight adhesions which may have formed will yield to the stretching that must be forcibly employed when the iris is grasped by the forceps.

The breach in the iris leaves an area of the filtration zone entirely free which even renewed pressure of vitreous can not close. Whenever escape of albumen from the vessels diminishes or ceases, when the aqueous returns to normal after an acute attack, the existence of this area which cannot be excluded by the root of the iris and through which excretion can be slowly reestablished, offers the greatest probability of saving the eye. On the other hand, the iris becomes firmly adherent after several attacks, and the vitreous does not return to its normal volume, so that excretion becomes permanently difficult. If this is the case and iridectomy is then done, it is hard to break up these adhesions and the results will be the less appreciable, the greater the time since the beginning of the disease. Hence the happy results of iridectomy in acute glaucoma, the disappointments in chronic. The coloboma has also a regulating action on the circulation of the fluids within the anterior segment of the globe; the communication between the anterior and posterior chambers--slight as it normally is—should be greater when the character of the aqueous changes as it does in glaucoma, and therefore any opening which encourages the flow from the posterior to the anterior chamber, encourages excretion and reabsorption. This is the only action which can be effected in the advanced stages of the disease.

Anterior sclerotomy proposed and defended by de Wecker can never take the place of iridectomy in acute glaucoma. Its action is only that of repeated paracentesis, evacuating the aqueous which in absolute glaucoma (its principal field) contains a great amount of albumen and permitting renovation of vitreous fluid. Filtration behind this cicatrix seldom exists.

Posterior sclerotomy advised by Mackenzie, Luca, Parinaud, etc., may cut short an acute attack of glaucoma, diminish the volume of vitreous, reestablish the anterior chamber and replace the root of the iris from its false position. Nevertheless, its action is transient and should be used solely as preliminary to iridectomy when the anterior chamber is so shallow as to make difficult the performance of the latter. As de Wecker says (Rapport a la Societes Francaise d'Ophtalmologie, 1901), its effect is truly surprising in such cases. It may be used, also, to calm the pain of absolute glaucoma.

Resection of the superior cervical sympathetic ganglion has been recently proposed (Jonnesco, Abadie.) We have already spoken of the mode of action of the sympathetic and how the vasoconstrictor effect of the section of this nerve may in certain cases diminish the amount of albumen transuded. But the influence must be only transitory.

De Vincentiis' operation will be useless after the iris has once become firmly adherent; apart from the technical difficulties encountered when the anterior chamber is very shallow, the knife may not strike the sclerocorneal edge, covered as it is by the root of the iris, but the newly formed angle of the anterior chamber. In such cases, there is little likelihood that the aqueous may escape through any suprachorioidal serous spaces even if the knife produces an iridodialysis and cuts the ciliary muscle.

Since Laquer introduced eserin in 1877, its use has become so popular that many surgeons employ it in acute glaucoma, systematically deferring iridectomy as long as possible. The mode of action of miotics has been variously interpreted; it is generally explained by the distention of the iris which it causes thus dragging it away from the filtration angle, but its principal action consists in contraction of the ocular vessels as Grönholm has experimentally shown (Annales d'Oculistique, October, 1900) so that the quantity of blood is diminished, the albumen is thereby proportionately decreased and filtration rendered easier. This mode of action which explains the temporary benefit of miotics does not, however, justify their persistent use to the postponement of iridectomy, since, if at the beginning the reduction of the quantity of albumen is such

that the eye's function is completely reestablished, the disease will nevertheless reach a stage where a miotic is not sufficient; the vitreous pressure will gradually crowd the iris against the filtration angle until adhesions are established; if now iridectomy is done, its effect will be problematical.

In the same way suprarenal extract may contract the intraocular vessels and reduce tension. Wessly (Heidelberg Ophthalmological Society, 1900) injected suprarenal extract under rabbits' coujunctivæ and saw the iris and ciliary vessels contract energetically. After puncture of the anterior chamber, the newformed aqueous was not coagulable and contained only traces of albumen (as the normal aqueous) proving that the vasoconstrictive action was so powerful that in spite of the emptying of the anterior chamber albumen could not escape through the vessel walls. In these experiments the quantity of aqueous secreted was less, but intraocular tension was reestablished with great rapidity.

The opposite of eserin, atropin, dilates intraocular vessels and favors dialbuminosis, and is capable of producing an attack of glaucoma in eyes with diseased vessels. Its noxious effect on eyes threatened with glaucoma, is well known.

CHAPTER 3.

Chronic Simple Glaucoma.

The nosologic picture of simple glaucoma is not yet well defined, nor are there distinctive signs to separate it from that group of atrophy of the optic nerve which has exaggerated physiologic excavation. Some authors would exclude the latter entirely and give to them the name which Graefe used, amaurosis with excavation of the optic nerve, explaining that, in many cases, there is not found an increase of tension characteristic of inflammatory glaucoma; but it is well known that, in many cases, the finger cannot decide with accuracy changes in tension, since this method of examination is deceptive, as differences may show themselves not only in examiners, but in the times of observation on the same patient at different hours of the day. Many authors have long ago shown how fre-

quently simple glaucoma changes to inflammatory glaucoma, with acute outbreaks, and how the two pathologic states may co-exist in one individual or in various members of the same family. It is unusual to have simple glaucoma go on to blindness without showing some hypertension, but these phenomena may be of such little influence that they are scarcely noticed by the patients themselves. De Wecker claimed to include in simple glaucoma all those cases which showed the least irritability, if it were only the most delicate and transitory cloudiness of the cornea, or any fugitive disturbance of the normal appearance of the eyes; almost all authors agree in recognizing the frequency in which there are seen disturbances comparable to the prodromes of glaucoma, i. e , cloudiness of the cornea, moderate dilatation and sluggishness of the pupil, turgescence of the anterior ciliary veins, shallowness of the anterior chamber, etc. Moreover, pronounced excavation of the optic nerve and constriction of the nasal side of the field of vision for white and colors are not enough to call the condition simple glaucoma if there are lacking signs of increased tension, demonstrable not only to the finger, but objectively, by means of instruments. In many cases, too, it is hard to decide by the ophthalmoscope whether an excavation is glaucomatous or atrophic; constriction of the visual field is not constant in simple glaucoma, nor can a concentric narrowing for colors be considered diagnostic between the two conditions (Bunge, Zentmeyer, Posey and de Schweinitz, Annals of Ophthalmology, 1899); increase of tension is the symptom characteristic of glaucoma, and if not present, the disease will not be essentially glaucomatous. It might be, as we shall see, an atrophic lesion of the nerve due to vascular disturbances, and an excavation due to lack of resistance, but all of this may be only the beginning of nutritive disturbance which will perhaps end in simple glaucoma.

The formation of the excavation and its causes have been differently interpreted. Here, as in inflammatory glaucoma, the trouble has been ascribed to a hypertension which depresses the nerve itself—an explanation purely mechanical. In 1858, however, Mueller showed that a normal intraocular tension could cause an excavation if the lamina cribrosa lost its firmness, and other authors

afterward have published cases in which an increase of tension, lasting for several months, caused no excavation.

These facts show that not one agent alone is involved in depressing the papilla; while in inflammatory glaucoma the principal influence is brought about by hypertension, in simple glaucoma, where increase of tension is moderate and transitory, the determining factor must be attributed to lack of resistance in the nerve itself.

In 1885 Schnabel invented the term, "Neuritis glaucomatosa," to describe that alteration in the optic nerve which is found solely in those cases of amaurosis with excavation, and is the same as the most constant lesion in glaucoma. This neuritis is primary and independent of intraocular tension, and is due to alterations in the retinal vessels. Its presence can be shown clinically by the discoloration of the papilla, which precedes the excavation, and which, for a long time, can be the only sign of disease. Cases are seen, too, where one eye is affected by glaucoma, but where the other, apparently, is unaffected; but Brailey and Rochon-Duvigneaud have many times demonstrated a particular discoloration of the papilla of the second eye.

These alterations involve the interstitial structure and the nerve fibres themselves, but the first is chiefly involved in that non-resistance which leads to excavation, since there may often be found glaucomatous excavations of considerable depth while nearly perfect vision is retained. Atrophy of the nerve fibres comes afterward, and localization there can be discovered by the corresponding involvement of the field of vision.

The primary cause of neuritis lies in some lesion of the ophthalmic artery. Von Graefe thought that amaurosis glaucomatosa was due to alteration in the central artery of the retina, while inflammatory glaucoma was caused by a lesion of the ciliary vessels. This idea has been since confirmed by a large number of observations, which have shown a vascular sclerosis, not only of the retina, but of the central artery, in glaucomatous eyes.

There is a variety of simple atrophy of the papilla in the old, due to atheromatous degeneration of the internal carotid and of the ophthalmic arteries (Bernheimer, Sachs,

Otto), and another which depends on thrombosis or embolism of the artery or of the vein; it is seen then, that lesions of the vascular canal are enough, of themselves, to produce degeneration of the nerve. They explain the cases intermediate between simple atrophy and glaucomatous atrophy, which are so embarrassing until they reach the point where an objective diagnosis can be made.

Neuritis glaucomatosa cannot, however, explain, by itself, the genesis of simple glaucoma; it may explain the formation of the excavation, but not the increased tension. The origin of this last must be sought in the nutritive disturbances which are produced in the vitreous as a consequence of vascular sclerosis.

Although we do not possess a sufficient number of cases to support our ideas, the two which will be reported later on and, above all, the close relationship existing between simple and inflammatory glaucoma where the former may become the latter, makes extremely probable the pathogenesis which is about to be given.

We have already spoken of the part which edema of the vitreous plays in the production of inflammatory glaucoma and how the vascular sclerosis is its determining factor causing the escape of albumen through the vessel walls. The more chronic the type of the disease the more important is the part played by the vitreous, and in simple glaucoma everything depends upon this factor. At the beginning the endarteritis of the central artery of the retina gives rise to changes localized principally in the optic nerve and produces the clinical picture called by v. Graefe amaurosis with excavation; but if these vascular lesions go on, at a certain moment escape of the albumen will occur. The normal nutrition of the vitreous will be disturbed and all those changes studied by Haensell will take place but in a lesser degree than in the inflammatory type. In the latter the total quantity of albumen contained in the aqueous, springs from two sources, the ciliary body which supplies the larger share and the vitreous. In simple glaucoma the ciliary body takes part in the process only to a slight extent at the end; while the normal fluid which escapes from the retinal vessels flows around the vitreous and pours into the posterior chamber, contains a certain proportion of albumen which mixes with

the aqueous and reduces its power of filtration until a true inflammatory glaucoma is set up; in the first case when infiltration is merely retarded there will be no actual sign of inflammation and the anterior chamber will preserve its normal depth.

When increase in the volume of the vitreous is very slow it takes a long time to crowd the root of the iris into the filtration angle and in some cases this never takes place, but with a sudden increase in the quantity of albumen this contact may be at once established and intensified by the irritant action which albumen exercises on all the tissues about the anterior chamber.

The constant threat implied in this proximity of the iris and the necessity of preserving free filtration justifies us in practicing iridectomy as soon as possible. One valid indication for its urgency is an increasing shallowness of anterior chamber.

The presence of albumen in the aqueous has been proven chemically in the two cases of simple glaucoma which are given below. In both the eye at the time of the puncture showed signs of hypertension which decided us to do the iridectomy which was performed in the first case. Unfortunately, patients with simple glaucoma, when there are no acute outbreaks, are not as a rule willing to submit to the operation and for that reason I cannot give analyses of aqueous in the quiet stage.

Observation XIV. Chronic simple glaucoma in the right eye and absolute inflammatory glaucoma in the left. Woman 50 years. Before the iridectomy, the aqueous was withdrawn from the right eye and analyzed as follows:

Density at 22.5°	1.0012
Water	98.2275
Mineral constituents	too small for measurement.
Organic "	1.7725
Quantity extracted	0.0677

Observation XV. Chronic simple glaucoma in both eyes. Man 40 years. The aqueous from the right eye was extracted.

Density	1.010
Water	97.9380
Mineral constituents	0.4124
Organic "	1.6496

As is seen, the proportion of organic constituents is less in both cases than that found in acute glaucoma (2 per cent.) and in chronic inflammatory glaucoma (3 per cent.). Moreover, the figures from these analyses cannot be given an absolute value in a pathologic sense, since, as has been said, the coefficient of filtration, which varies normally within certain limits according to the quantity secreted and to the extent of the filtration area, must in glaucoma, be subject to the condition of the filtration area and the canal of Schlemm, to the extent over which the iris may be adherent, so as to prevent escape of aqueous.

CHAPTER 4.

Secondary Glaucoma:

Ocular affections which may be complicated with hypertension are so great and the causes are so different and the anatomical lesions so varied that it is not strange to find great confusion in this group of diseases as compared with those which may be grouped under a common cause, that is, an increase in intraocular tension.

Hypertension, a phenomenon found in all, may end in the production of true glaucoma when profound lesions are associated with it, such as vitreous disturbances, etc.

I have tried to give a classification of cases of so-called secondary glaucoma, referring the observed phenomena to their primary causes and showing how all of them may be explained according to the law of obstruction of the filtration angle and according to the theory which this work tries to establish.

As in primary glaucoma, so here, there are two causes to which increased intraocular tension is due, first—the greater difficulty experienced in excreting the ocular fluid due to the presence in them of abnormal elements, such as albumen and fibrin and, second—the occlusion of the filtration angle due often to mechanical causes, luxation of the lens, etc., or to this mechanical occlusion primarily and inflammatory occlusion later on (posterior synechiæ).

The two factors may work separately or together. They may be simultaneous or successive.

Among the so-called secondary glaucomas there are some in which only the phenomena of hypertension are

evident and which if properly treated at the beginning may become normal again. In others, the true secondary glaucoma, hypertension is associated with all those organic disturbances characteristic of glaucoma.

I. LUXATION OF THE LENS.

The most dangerous forms are those in which the lens is retained in the pupil or in the anterior chamber, since here hypertension is an unavoidable consequence. The lens in trying to pass through the pupil is either caught in it and produces a true occlusion with the usual consequences or it escapes and drops into the anterior chamber where it produces a violent disturbance of the aqueous which is thus crowded into the posterior chamber and forces the iris against the lens and cornea, to form adhesions which block up the pupil and prevent any communication with the anterior chamber. If the pupil is not occluded hypertension is not produced. This mechanism has been demonstrated anatomically by Priestley Smith (Ophthalmic Review, 1882) and well explains those recorded facts of increased tension when the lens lay in the anterior chamber if the patient leaned forward, a tension which disappeared, however, when the patient threw his head backward allowing the lens to rest upon the iris.

J. L. Minor has reported a case where hypertension was produced when eserin was used so that with a strongly contracted pupil the iris rested against the back of the lens.

If this state of occlusion persists the signs of true glaucoma, excavation, etc., appear.

In lateral luxations of the lens in addition to the rupture of the zonula and of the hyaloid and the consequent escape of vitreous there may be added the pressure of the lens upon the posterior surface of the iris and its root, all of which is enough to obstruct the filtration angle and therefore to diminish excretion.

II. TRAUMATIC CATARACT.

The principal factor in increase of tension after wounds of the lens is the difficulty in filtration of the aqueous,

loaded as it is with an excess of albuminoid matter due to the solution of lens substance in this fluid. In some cases when the wound of the lens is very small and the swelling of the lens very great the ciliary processes and the root of the iris may be crowded into the filtration angle, but if the wound to the capsule is extensive and the swollen lens masses escape easily into the anterior chamber, the former mechanism is more noticeable. Phenomena of hypertension due to discission, according to Fukala's method of treatment of high myopia, which often simulate acute glaucoma, give almost an experimental proof in favor of the theory of faulty filtration due to albumen in the aqueous.

III. DISCISSION OF SECONDARY CATARACT.

No good explanation has yet been given of the cause of those severe cases of hypertension which sometimes follow discission of the capsule. Generally they are attributed to the stretching of the ciliary processes as the knife passes through the pupillary membrane or to the various movements of dislaceration, but this does not explain the constant absence of hypertension when the division of the capsule has been done after extensive section of the cornea. Mention has already been made of the danger which accompanies wounds of the vitreous and Knapp says he has found vitreous to escape during an iridectomy performed to diminish tension but he could not trace the relationship between them. It is easily understood that when through any of the movements of the knife vitreous escapes into the anterior chamber the aqueous is changed in character and cannot filter through Schlemm's canal. Iritis, total posterior adhesions, occlusion due to the operation ascribed as the cause by certain authors, cannot explain the acute attacks which follow four or six hours after the discission, nor the dilation of the pupil, nor the sudden termination after a few hours; and they explain only those cases in which glaucoma sometime after the discission was accompanied by excavation of the papilla and diminution of the anterior chamber. In these cases the cause is not alone mechanical, that is, obstruction to the pupil, but it is the extremely difficult excretion of aqueous loaded with inflammatory products.

IV. EXTRACTION OF CATARACT.

This last mechanism may be invoked to explain glaucoma after cataract extraction when there was no earlier tendency to primary glaucoma in arterial sclerosis, since logically the extraction should not be blamed for a glaucoma which shows itself years after the operation.

In ten eyes blinded by secondary glaucoma after operation which Treacher Collins examined microscopically, the filtration angle was in all of them found obstructed near the cicatrix; in seven or eight obstruction involved the opposite side as well, and probably the whole periphery of the iris. Where there was no adhesion the filtration angle was full of inflammatory exudate and in all ten cases the capsule was adherent to the cicatrix.

V. DELAY IN THE RESTORATION OF THE ANTERIOR CHAMBER AFTER CATARACT.

When after extraction the anterior chamber is not reproduced and the iris lies against the cornea, tension as a rule remains low, but in some cases and suddenly tension is increased and danger threatens. The determining cause is here adhesion of the iris to the cornea and consequently obstruction of filtration. Although aqueous is not secreted in such cases, due to certain mechanical conditions (Uribe Troncoso, La Clinique Ophtalmogique, August 25, 1898), the normal nutrition of the vitreous is checked and this may at the end of a certain time produce such an increase of volume in the vitreous that hypertension results. Iridectomy, posterior sclerotomy, combined with pressure over the cornea, destruction of the adhesions between iris, lens and cornea and re-establishment of aqueous secretion may overcome this increase in tension.

VI. IRIDOCYCLITIS SEROSA.

We have already referred to the causes of hypertension in this inflammatory condition, and to that factor which brings about the increase in the depth of the anterior chamber when, in place of ending in atrophy of the globe, true glaucoma is established; the anterior chamber, at first deep, now becomes shallow, a new proof of the notable influence which the swollen vitreous exercises.

Simple iritis is rarely accompanied by hypertension, but in cyclitis it is an almost constant symptom at first.

VII. SECLUSION OF THE PUPIL.

Posterior total synechia, preventing access of the aqueous to Schlemm's canal and necessitating its accumulation behind the iris, produces, to a noticeable degree, the conditions of mechanical retention. The aqueous, in these cases, has no way of escape, not even through the vessels on the anterior surface of the iris. The nutritive fluids of the vitreous become stagnant, circulation through the vorticose veins is more and more difficult and glaucoma supervenes. If iridectomy is not performed, the eye becomes disorganized and atrophies.

VII. ANTERIOR SYNECHIÆ.

The cause of increased tension in these cases is most obscure and most debated. It has been attributed to the stretching of the iris and of the ciliary body, so that, reflexly, there is produced an increase of aqueous; but, to conform with this idea, the anterior chamber ought to be deeper, at least where the iris is free, while precisely the opposite is really observed; the true cause is two-fold: First, the closeness of the iris to the zone of filtration, and, second, intercurrent inflammations which increase the quantity of albumen in the aqueous. When the iris is adherent to the edges of a corneal perforation the crowding of the root of the iris into the filtration angle does not produce adhesions in spite of the growth of the staphyloma, because the iris is fixed at both ends; but when the pupillary border of the iris follows the distension of the cicatrix due to intraocular pressure, as happens in conical staphylomata (Arlt), this stretching will produce adhesions and make excretion of aqueous more and more difficult. If, under such conditions, some infection, or any vascular disturbance occurs, the quantity of albumen in the aqueous will increase and the iris will become so adherent to the cornea that the anterior chamber disappears—when we have glaucoma. In all the cases of secondary glaucoma, after leucoma adherens, examined microscopically (observations 3 and 5), the anterior chamber was found abol-

ished, the iris and the lens lay against the cornea, the filtration angle was obstructed, and all the tissues were found inflamed, especially in the anterior part of the eye.

Hypopion ulcers, recurrent iridocyclitis, hyalitis, etc., all produce inflammatory structural changes in the anterior chamber, especially at the filtration angle. The vitreous softens and increases in volume, and helps to diminish or abolish the anterior chamber in the last stages of the disease.

IX. INTRAOCULAR TUMORS.

In a certain period of their development, nearly all intraocular tumors give rise to hypertension. The lesions found in the anterior segment of the eye are identical with those after true or spontaneaus glaucoma: the same adhesion of the iris at the filtration angle and diminution in the anterior chamber, etc. As is well known, the appearance of glaucoma is independent of the size of the tumor. There is no exact relationship of cause or effect between prolapse of the retina and glaucoma, as Fuchs would wish; since there are cases in which this last is produced without total prolapse, it is necessary to admit that here, as in simple glaucoma, the primary cause is a difficulty in excretion of aqueous due to some alteration in its composition. The special disposition of the vascular system of the eye, which discharges itself at the equator of the vorticose veins, makes it easy for tumors to produce a venous stasis and, consequently, a sluggishness in the arterial stream and, therefore, a tendency to dialbuminosis. An anatomical examination of nine eyes enucleated for sarcoma of the chorioid (Krudener, Archiv. fur Augenheilkunde, Vol. XXXI) shows compression of the vorticose veins and diminution or obliteration of their caliber through sarcomatous infiltration of their walls. These changes and the venous stasis produced were proportionate to the increase of the intraocular tension demonstrable during life. Occlusion of the iridic angle, by new growth in some cases and by pigmentary emboli in others, has been reported. Finally, a passive growth from the vitreous or, at least, of a fluid more and more loaded with albumen from the aqueous, so that the tumor increases in vol-

ume and compresses the vitreous, must be considered in those cases of rapid advance of the prolapse, to explain the rise of tension.

CHAPTER 5.

Experimental Glaucoma.

With the object of proving, experimentally, the phenomena caused by increase of albumen in the aqueous, I began a series of tests by injecting into the anterior chamber of some rabbits a few drops of vitreous; into others, albumen from an egg. I did not expect to produce a true glaucoma, nor do I claim that I had time to elaborate the tests as I might have desired; nevertheless, they are enough to demonstrate that hypertension always follows increase of albumen in in the aqueous, when the proportion becomes high enough, and, united to those of Bentzen, they reaffirm the relationship of cause and effect between diminution of the coefficient of excretion and primary hypertension, or between adhesion at the filtration angle and subsequent definitive retension, with its train of symptoms, such as excavation of the pupil, etc.

Knies was able, by injecting into the vitreous a few drops of sterilized olive oil, to reproduce the conditions of inflammation of the excretory passages (filtration angle and optic papilla), in which he supposed lay the primary cause of glaucoma. He did not produce iritic adhesions, as he had hoped, but he obtained premonitary attacks. The irritation caused by the injections was such that not only were cellular infiltrations produced, but, also, he found a great amount of albumen exuded and prolapses of vitreous and retina.

Bentzen, after scraping the root of the iris by a Graefe knife introduced into the anterior chamber at several places, could produce (in the rabbit's eye) adhesions at the filtration angle and a permanent increase of tension, with all its consequences, including excavation of the papilla, after eight days.

There was still lacking, to be sure, the determination of the essential cause, and for the purpose I made the experiments which were so ably managed by my colleague,

Dr. Daniel Vergara Lope, physiologist in the Physiological Laboratory of the National Medical Institute.

As it is very difficult in a normal eye to prevent injected fluid from escaping through a wound made in the cornea, I decided, in order to avoid corneal edema or traumatism to the anterior chamber—in the first series of experiments to extract a little vitreous directly, and thus to redue tension, injecting subsequently this same fluid back of the limbus into the anterior chamber; but this method too was difficult, so in a second series I took the vitreous from one eye and injected it into the other eye after previously emptying the anterior chamber of its aqueous. I give the experiment as follows:

Rabbit No. 1. By a sterilized Luer's syringe, after using cocain, the sclerotic was punctured at the equator and four drops of vitreous were extracted to be slowly injected into the anterior chamber through an oblique perforation at the limbus. The chamber increased in size immediately and the pupil at first dilated and then contracted taking an elliptical form. Tension could not be estimated, as pressure by the finger caused fluid to escape.

On the second day the eye was injected, the cornea transparent, the aqueous a bit turbid, the anterior chamber smaller: the pupil still small and elliptical. A delicate white veil covered the iris and lens. There were some opacities in the lens. Tension plainly + 1.

Third day. Anterior chamber shallow, the iris no longer normal and showed a dilated vessel above; there was an adhesion to the lens. The lens was transparent and the fundus visible. Tension less than the day before.

Sixth day. No more conjunctival injection, anterior chamber more nearly normal, iris reacting well to light. At the center of the lens the exudate (from the iris) was beginning to absorb. Tension + 1 ?.

Eighth day. Absorption continuing. Tension lower.

Sixteenth day. The eye normal. The pupil free but perhaps a bit more contracted than that of the other eye. Tension normal (equal to that of its fellow).

Rabbit No. 2. Right eye. Injection of vitreous into anterior chamber of same eye, followed by increased depth of anterior chamber narrowness of pupil.

In the left eye extraction of aqueous and injection of normal salt solution (7:1000) stained with indulin 1:100. Anterior chamber deepened and turned black.

Second day. Right eye anterior chamber smaller, pupil contracted and there was a faint cloud over it and the lens. This showed some dilated vessels. Tension increased.

Left eye. Abundent white exudates over pupil and bordering iris which was swollen forward. The dark color of the aqueous notably diminished. Tension perhaps minus.

Fourth day. Right eye. Exudate on the lens nearly absorbed. Anterior chamber normal. Iris still hyperemic.

Left eye. Aqueous not discolored; pupillary exudates much diminished, tension normal.

Sixth day. Left eye. Black pupil, tension normal.

Tenth day. Right eye. A delicate white line across pupil, tension normal.

Rabbit No. 3. Extraction of vitreous from left eye and injection of six drops into right eye from which the aqueous had been previously withdrawn. To avoid escape of fluid the puncture was made in sclerotic three mm. from limbus, crossing the root of the iris without touching the lens, into anterior chamber.

The second day the left eye showed little reaction; in the right, however, the conjunctiva bulbi and third lid were injected, the cornea was normal, aqueous turbid, anterior chamber smaller, pupil contracted; the iris was somewhat discolored and at its edge was seen a whitish membrane occupying area of the pupil. Tension increased. At the end of three days, bulbar injection had disappeared, pupillary exudate loosened from iris which had retracted, and was absorbing. Two days later the injection was repeated, with vitreous from the other eye, but the vitreous seemed much less normal than before. There followed the same reactions and hypertension but of less degree and within 4–5 days the eye was normal.

Rabbits 4 and 5. The same phenomena with hypertension at first which gradually diminished.

Rabbits 6 and 7. Extraction of vitreous and staining it with indulin 1:200 and injection into anterior chamber of the other eye, previously emptied. Intense coloration

(blue) of aqueous. After two days rabbit No. 6 showed reduced anterior chamber occupied by exudate hanging from the anterior part of the iris across pupil. Blue color disappearing. Tension + 2.

Rabbit No. 7. Here the quantity of indulin was greater and the cornea therefore was infiltrated and showed a bluish yellow stain. Tension + 3. Considerable injection at the periphery of cornea and over the whole eyeball. Enucleation.

The histological examination by Dr. Manuel Toussaint resulted as follows: General leucocytic infiltration of the cornea; Descemet's membrane ruptured in several places; anterior chamber occupied by an exudate the meshes of which were filled with leucocytes, and which was adherent to the iris on the surface of which it was notably thickened. The angle of the anterior chamber showed Schlemm's canal quite free but Fontana's spaces full of migrated cells. This corneal infiltration was probably due to the forced injection which ruptured Descemet's membrance and favored the keratitis.

Five days after the injection tension became normal in rabbit No. 6. The exudate had disappeared nearly completely from the pupil, the center of which was clear, and the blue discoloration of the aqueous was gone.

Rabbit No. 8. Aspiration of aqueous from anterior chamber and injection into it of egg albumen stained with indulin—the albumen taken directly from an egg with a sterile syringe. The anterior chamber increased in depth and there was discoloration.

Second day. Eye injected, conjunctiva chemotic. Tension + 2. Anterior chamber deeper than normal, iris contracted.

Fourth day. Anterior chamber less deep, tension diminishing.

Sixth day. Tension normal, aqueous still discolored.

Eigth day. Iris still discolored, anterior chamber about normal. Tension — 1 ? Conjunctival injection gone.

Tenth day. Transparent aqueous withdrawn with a syringe and a second injection of stained egg albumen made.

Twelfth day. Anterior chamber deeper, cornea opaque at the center and somewhat staphylomatous, at its upper

border a delicate line of newformed vessels. The whole eye shows intense reaction, T. + 1. Pupil irregularly dilated. Enucleation.

Histologic examination showed the following: In the cornea a central band of migrated cells, approaching the surface of the membrane in some areas. The filtration angle normal, a few leucocytes in Fontana's spaces above; below the spaces are filled with a mass of exudate. Canal of Schlemm unaffected. Anterior chamber full of homogenous exudate, containing but few leucocytes at its edge; there is a large plug of leucocytes against the cornea. The leucocytic infiltration extended through ciliary body and chorioid.

Rabbit No. 9. Puncture of sclerotic and aspiration of two drops of vitreous. Without withdrawing the needle it was directed forward by the side of the lens and the vitreous injected into the anterior chamber.

Second day. Eye moderately injected, pupil circular and contracted; a traumatic cataract had formed and some cortical substance lay in the anterior chamber. T. + 2.

Third day. Anterior chamber full of cortical substance. Iris normal, tension increased.

Sixth day. Injection of globe disappeared, anterior chamber less, pupil moderately dilated, but a small posterior adhesion above. Some cortical substance. Tension normal.

Eleventh day. Cortical substance gone, opacity of lens prevents view of fundus. Anterior chamber deep, tension normal.

Sixteenth day. Normal.

Resumè. Injection of a liquid albumen into the anterior chamber produces two classes of phenomena; manifest hypertension and signs of reaction. The first must not be ascribed alone to the greater difficulty of excretion, since in those cases where tension was increased and reaction most intense the angle of the anterior chamber was preserved and Schlemm's canal with Fontana's spaces were open. The consecutive diminution of the anterior chamber shows, moreover, that there was no hypersecretion of aqueous to which to ascribe this tension.

The phenomena of irritation were no doubt due in part

to traumatism from the injected fluid, but were also caused chiefly (except in Rabbit No. 7 in which there was probably infection posteriorly) by the action of some substance affecting all the tissues about the anterior chamber.

In the animal into which albumen was injected, the reaction in the conjunctiva was much more intense and the chemosis more marked; in the second injection the symptoms of reaction increased still more and were accompanied by staphyloma of the cornea.

The delicate membrane which covered the iris was probably due to coagulated albumen.

Finally, this cycle of phenomena and the return of the eye to the normal, indicate that when the albumen is eliminated, the cause of hypertension no longer is present. The blue discoloration of the aqueous persisted longer in those eyes in which vitreous or albumen was injected than in those in which normal salt solution had been injected, the elimination of which took place with greater rapidity.

AN OPERATION FOR THE ADVANCEMENT OF THE STRAIGHT MUSCLES OF THE EYE, WITH TWO MODIFICATIONS, AND REMARKS UPON THE THEORY OF ITS ACTION.

By Herbert Wright Wooton, M. D.,

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ASSISTANT SURGEON MANHATTAN EYE AND EAR HOSPITAL, AND OPHTHALMOLOGIST TO THE GERMAN POLIKLINIK, NEW YORK.

In the Archives of Ophthalmology (May 1901), the writer briefly described a new method of advancement, which attempted to combine the advantages of those of Agnew and Landolt and, at the same time, treated the conjunctiva in a manner differing from that of either. The operation was designed for those cases in which a considerable effect is desired, and is particulary applicable when the operator wishes to advance one of the straight muscles of the eye without performing a tenotomy of its antagonist. In the absence of infection, it is followed by little or no reaction, edema of the lids is never observed and cold applications are never required, while the resulting disfigurement is of short duration. Since his previous description, the writer has sought to modify this operation in one or two particulars, and these modifications have tended to facilitate its performance, while a more extended experience with its technique has taught him the importance of emphasizing certain of its details, attention to which is essential for its success. It is for these reasons that it seems advisable to describe this operation again and, in its present form, the writer feels that he can confidently recommend it to his colleagues as fulfilling satisfactorily the requirements of a powerful advancement which, to a certain extent, can be graded to suit existing conditions, which is at least as easy to perform as that of any other method, and which produces a minimum of reaction and of temporary disfigurement.

When an external or an internal rectus is to be advanced, the primary incision of the conjunctiva semi-circumscribes the cornea, one millimeter from its margin, and extends from a point corresponding to the superior extremity of the vertical meridan of the cornea above, to a point corresponding to the inferior extremity of its vertical meridan below. No additional incisions in the conjunctiva are necessary. The conjunctiva included between the extremities of the original incision is now dissected free from the underlying tissues, toward the canthus, to a point well beyond the insertion of the tendon and, in this dissection, it is important, in order to avoid subsequent reaction, that Tenon's capsule should be disturbed as little as possible. The flap should consist of conjunctiva alone. In order to simplify what follows, let us suppose that the operation is being performed upon one of the externi. An assistant now holds the conjunctival flap away from the globe with forceps while, with a a squint hook applied to the inner canthus, he rotates the globe slightly toward the nose, thus exposing a clear field for the next procedure. The operator now picks up Tenon's capsule below the inferior border of the tendon and posterior to its insertion, and he should be careful that the point included in his forceps is sufficiently below the tendon to avoid the possibility of including any of its fibres. With the scissors, he makes a small opening in Tenon's capsule in this situation. A pair of angular forceps is particularly serviceable for seizing Tenon's capsule beneath the conjunctival flap. Those used ordinarily for iridectomy answer this purpose very well, when no other variety is obtainable, but it is desirable that the forceps employed should possess a spring catch, and those of the author which fulfill this requirement and are provided with an angular extremity and mouse-tooth extremities are really exceedingly satisfactory. In seizing the capsule their tips should be pressed firmly against the globe, for the inward rotation of the eyeball stretches the capsule of Tenon somewhat and makes this structure slightly difficult to seize. The border of the opening being retained in the bite of the spring forceps, a squint hook is now inserted through the opening and, its point being kept closely in contact with the sclera, it is passed beneath the

tendon and well beyond the upper border of the latter, where another incision in the capsule frees its point. The operator should be careful that the point of the hook is well above the upper border of the tendon before again incising the capsule, otherwise he may button-hole the tendon and, in his subseqent procedures, advance but a portion of its fibres, thus diminishing the effect of his operation. It is very easy to make this mistake, particularly when dealing with an atrophic externus. When the hook is properly passed, the whole breadth of the tendon is exposed lying flat upon it, not rolled up into a string, as usually is the case when the hook is forced through Tenon's capsule from below upward. Two incisions are now made in Tenon's capsule, one at the upper, the other at the lower border of the tendon, commencing at the hook and running toward the canthus for a distance corresponding to the length of tendon that the operator desires to excise, and the closed points of the scissors are inserted between this portion of the tendon and the sclera to assure the operator that the path is clear for the passage of the sutures.

Three sutures are employed and each is armed in the usual way with two curved needles, one at either end. The sutures should be of black silk and not finer than No. 5. A finer silk than this is apt to cut its way out before healing is completed and, on account of the strain upon the sutures, this is particularly apt to be the case when this operation is performed without tenotomy of the opposing muscle, the manner in which the writer almost always employs it. The strength of the sutures should always be tested before operating, for, should one of them break while being tied, it will be exceedingly difficult to replace it accurately. It is absolutely essential that the needles should be small and sharp. A dull needle is not only aggravating but, when one comes to attempt its passage through the superficial layers of the sclera, it may prove dangerous as well. By repeated futile efforts in this direction, the sclera becomes gradually thinned at one point and, on account of this thinning and of the force required to insert a dull needle, it is perfectly possible that perforation of the sclera and evacuation of the anterior chamber might result. The writer has never known this

actually to occur, but he has had cause to fear it on more than one occasion, when operating with dull needles. As the toughness of the scleral tissues dulls their points very rapidly, it is best not to use the same needles for more than two advancements.

The handle of the squint hook is now directed toward the nose, and the first needle is passed beneath the upper border of the tendon for about one-third of its breadth and as far in the direction of the canthus as the tendon has been freed from the structures beneath. It transfixes the tendon at this point, and the suture is pulled partly through. The needle is now passed through the conjunctival flap from its under surface, not at a point corresponding to the passage of the suture through the tendon, but at the junction of the upper quarter of the free edge of the flap with its lower three quarters, and about a millimeter removed from its margin. The suture is again pulled partly through and the needle is removed, in order to avoid the possibility of confounding the two ends of the suture in the subsequent steps of the operation. The second suture, passed in a similar manner from below through the tendon from its under surface and near its lower border, perforates the conjunctival flap one millimeter from its edge, at the junction of its lower quarter with its upper three-quarters, and this needle is likewise removed. The operator now takes the squint hook, which up to this time has been held by the assistant and maintains the direction of its handle toward the nose, while the assistant, folding the sutures, draws them toward the external canthus. This procedure puts the tendon well upon the stretch and removes the sutures from the danger of being cut when the operator severs the tendon, which he now proceeds to do, close to, but at a safe distance from the line of the sutures. The tendinous extremity remaining attached to the sclera is then excised. The operator now passes the third suture through the middle of the tendon near its severed margin, and through the conjunctival flap immediately above and one millimeter from its free edge, while the assistant elevates the sutures already passed in order to expose a perfect view of the tendon's lower surface. The operator should now examine all the sutures at their points of passage through the tendon, in order to assure himself that a

firm hold has been obtained in each case and that he has not endangered the subsequent security of the sutures by having cut the tendon too close to their line of insertion and, should any suture seem to him insecure, it can easily be withdrawn and reinserted at this stage of the operation. The operator should also assure himself that the tendon has been completely divided and, should any strands remain attached to the sclera, they should be severed. These points are of extreme importance, and inattention to either of them may result in failure to obtain a good result. The under surface of the tendon is now irrigated, in order to remove all clots. In his earlier operations, the writer was in the habit of passing all three sutures before dividing the tendon, but the method above described, which was suggested by Dr. Gage, of the Manhattan Eye and Ear Hospital, is infinitely easier and quicker and avoids the possibility of the sutures becoming mixed and snarled.

The operator is now ready to proceed with the needles at the other ends of the sutures. These should be passed through the narrow rim of conjunctiva remaining attached to the cornea, one at a point corresponding to the horizontal meridian of the cornea, and the other two at the upper and lower angles, respectively, of the conjunctival incision. They should all dip somewhat deeply into the scleral tissue in order to secure a firm hold, and the middle needle should be passed vertically, the upper and lower needles horizontally, in order to avoid all danger of entering the anterior chamber. The operator can greatly facilitate their passage through the superficial layers of the sclera by first seizing firmly the conjunctiva and episcleral tissues, at the point desired, in the bite of a fine tooth forceps held perpendicularly to the globe, and then passing his needles through the tissues immediately beneath those included in the forceps. The points of the needles should make a sharp dip into the sclera and then be quickly elevated. During the passage of the needles, the assistant steadies the globe with a squint hook and maintains it in the position required.

The assistant now rotates the globe strongly toward the external canthus with fixation forceps, applied between the inner canthus and the cornea, and the operator ties

the corresponding ends of each of the sutures, advancing the tendon by a broad base to the corneal margin, while the conjunctiva accompanies it and covers it snugly without leaving a disfiguring bunch of tissue at the conclusion of the operation. The eye is again irrigated, all blood-clots are removed and the operation is finished.

The immediate result is remarkably smooth and satisfactory and, at the subsequent dressings, it is common to find the reaction limited to redness of the conjunctiva covering the advanced tendon, the rest of the eye maintaining its normal color. *The eyes should be bandaged for a week* and should be dressed twice daily. At the end of a week, union will be firm, and the bandage may be dispensed with and the sutures removed. A reddish blotch marks the site of the operation for some weeks longer, when it gradually assumes a yellowish tint and, by the end of six months, it has usually disappeared. Even during this period it is not very evident, for, except during marked lateral movements of the eyes, it is, to a great extent, hidden behind the external canthus when the externus has been advanced, the slight enophthalmos produced when the opposing muscle has not been cut, aiding materially in this result. After advancement of an internus, the resulting temporary disfigurement is somewhat more noticeable.

The writer considers the employment of the third, or middle suture as a matter of great importance when a full effect is desired, more particularly when the advancement is performed without tenotomy of the opposing muscle, for he is convinced that the degree of permanent correction obtained in such cases is not determined, for the most part, by the shortening resulting from the excision of a portion of the tendon moderate in length or by the shortening resulting from the advancement of the tendon's insertion, but, rather, by the better leverage afforded by the new attachment of the tendon at the corneal margin and the consequent strengthening, thereby, of the function dominated by the muscle advanced. If this be true, it is obvious that the point of attachment farthest from the cornea will determine, to a great extent, the leverage action of the muscle, and, if only a superior and inferior suture be employed, the central portion of the tendon may

sag toward the canthus and, by becoming attached at some distance from the corneal margin, ultimately diminish, to a certain extent, the primary result of the operation. Clinical experience confirms this theory. If the degree of permanent effect be determined, for the most part, by the leverage action afforded, and not by a moderate shortening of the muscle, it may be asked why the operator should excise any of the tendon. It is necessary, in order that the sutures may be passed through the tendon, that the under surface of the latter should be more or less injured, and, as the surface of Tenon's capsule, from the margin of the cornea to the point of original attachment of the muscle, must be denuded, the subsequent apposition of two such injured surfaces must result in the formation of adhesions, extending toward the canthus for a distance equal, at least, to the length of the injured surface of the tendon. Hence, in such cases, the real attachment of the tendon after its advancement would not be limited to the corneal region, but would extend from this point toward the canthus for a considerable distance, thus diminishing the leverage action desired. By excising the tendon close to the points at which the sutures perforate it, we get rid of that extent of tendon, the under surface of which has been injured, and apply an undisturbed surface to the more or less injured capsule of Tenon covering the sclera, thereby limiting, as far as possible, the formation of adhesions toward the canthus. On one occasion, the writer had the opportunity of performing a tenotomy on a muscle, an inferior rectus, advanced by this method, and found that the hook could be passed freely beneath the muscle to a point less than two millimetres from the margin of the cornea. If the tendon be divided before the first two sutures have been passed, it will then become necessary to seize it with fixation forceps, and extensive injury of its under surface will usually result. It is for this reason that two sutures are passed before the tendon is cut, a procedure which is also easier than the passage of all three sutures after the tendon has been divided.

Although, when advancements are made without tenotomy of the opposing muscle, the leverage action appears to be, for the most part, the determining factor in the de-

gree of angular correction obtained, the amount of enophthalmos produced is determined entirely by the amount of shortening of the muscle advanced; and, although moderate enophthalmos is rather to be desired in most cases and tends to hide any slight degree of deviation that may remain, too much enophthalmos is to be avoided for cosmetic reasons, particularly in those eyes which are naturally rather deeply set. This seems to be a good reason for not excising a considerable length of the tendon. A piece two millimetres long is certainly sufficient in the most marked cases of concomitant strabismus. *These considerations apply only to cases of concomitant strabismus, and are applicable to these only when the advancements are performed without tenotomy of the opposing muscle.*

This operation is capable of certain modifications. Should one not desire the fullest effect, the muscle can be advanced straight forward to the corneal margin, without extending its upper and lower extremities to the horns of the conjunctival incision. In this case, the sutures should perforate the conjunctival flap one millimeter from its margin, but directly over their points of passage through the tendon. Two additional conjunctival sutures will then be necessary, one above and the other below, in order to give a smooth result. Should a still more moderate effect be desired, the conjunctival incision may be made further from the corneal margin and, three sutures being employed, the tendon can be advanced to any point between its former insertion and the margin of the cornea, the conjunctiva being dealt with in the manner just described. In cases of functional insufficiency of convergence which have resisted, or which have been but temporarily benefited by general treatment and prismatic exercises, the writer usually employs one or other of these variations, the selection depending upon the degree of insufficiency that may be present.

The writer has performed this operation about eighty times and, in its present form and with the modifications described, he finds it so entirely satisfactory that he feels that he can with confidence recommend it to his colleagues, with the hope that they will be well pleased with it. With a little practice, both externi or both interni can readily be advanced by this method in fifteen or twenty minutes, and the difficulties of its technique are easily overcome.

A CLINICAL AND PATHOLOGICAL REPORT OF TWO CASES OF CHORIOIDAL SARCOMA DIAGNOSED IN THE FIRST STAGE AND REMOVED BY ENUCLEATION—NO RECURRENCE.

By H. V. Würdemann, M. D.,

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ILLUSTRATED.

Cases of intra-ocular sarcoma diagnosed in the first stage before complete blindness and inflammatory symptoms have set in are sufficiently rare and interesting to merit a record in ophthalmic literature. Such is that

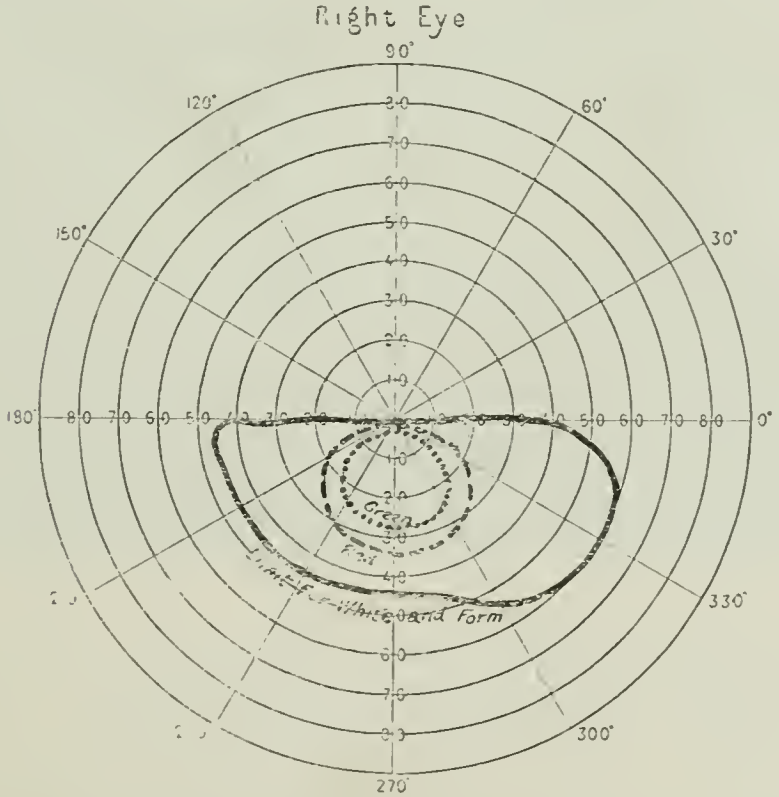


Fig. 1. Hemianopic Visual Field in Sarcoma of the Chorioid.

reported by Dr. Frederick Krauss of Philadelphia in this number of the Annals. I, therefore, supplement his report by the following description of two other cases, one of which has already been published in abstract in these

Annals,* but which in this connection is of sufficient interest to bear repetition.

SARCOMA OF CHORIOID. DIAGNOSIS IN INCIPIENCY. ENUCLEATION. NO RECURRENCE.

Case I. March 30, 1896. Mrs. C., aged 48, of Whitewater, Wis., farmer's wife (referred by Dr. Furlong), negative general history, except neurasthenia and bowel trouble; came on account of defective vision in the right eye for three months, which had been struck by a stick about six months before; no history of pain or inflammation. *Stat. præs.* anemic and neurotic. Eyes: L., V. 6/VI, normal in every respect; V. 6/LX; V. F. hemianopic, only the lower half being preserved. (See Fig. 1) Tn. Imperfect reaction of pupil to light from above.

By oblique examination, the pupil being dilated, a rounded bluish mass was visible in the lower part behind the iris. Direct illumination by the ophthalmoscopic mirror showed the retina detached at the lower half, beginning under optic disc. Under this there was a greenish area, due to the sub-retinal exudate. The whole lower portion of the field was occupied by a rounded purplish mass, over which coursed blood vessels; there being a well defined space between the apex of the tumor and the retina. (See Fig. 2.)

Despite the fact that the eye had no pain, little tension, and could yet see, the ophthalmoscopic picture was so perfect that I did not hesitate to make a diagnosis of intraocular tumor, of probable sarcomatous nature. After some correspondence with her physician, she returned to me three weeks later, when the vision was found reduced to counting fingers at three meters, with visual field and the iris reaction more hemianopic. The patient had no pain, although the tension was now perceptible. Enucleation under ether was done April 20, the location of the tumor being marked by a black thread in the conjunctiva. Patient had uninterrupted recovery, and was fitted later with an artificial eye. Since the operation she has had no symptoms.

*Illustrative cases showing the indications for enucleation of the eyeball, etc., H. V. Würdemann, M. D., Annals of Ophthalmology, Oct., 1897.

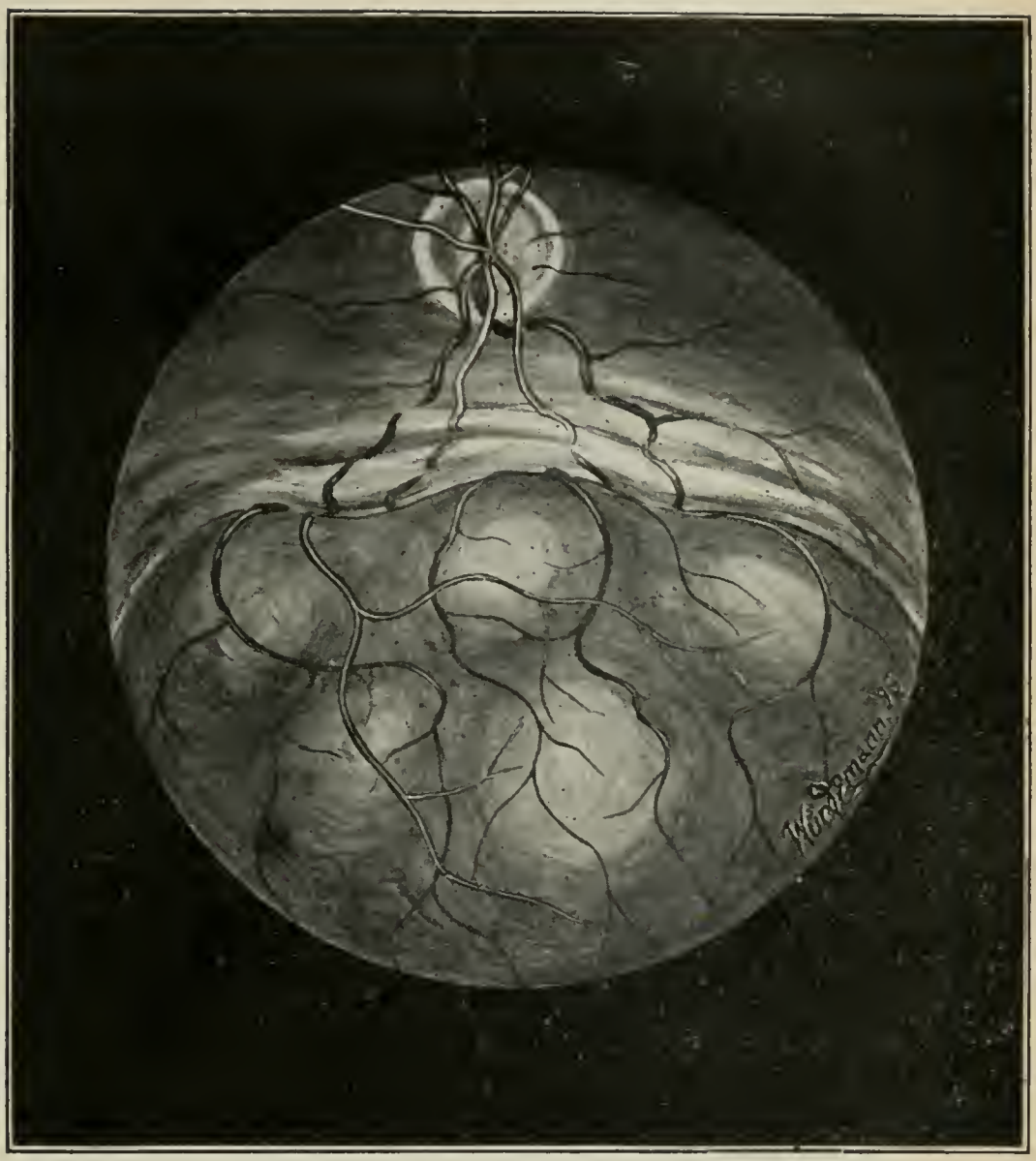


Fig. 2. Fundus Oculi by Direct Ophthalmoscopy in Sarcoma of the Chorioid. (This picture also well illustrates the ophthalmic appearances of Dr. Krauss' case and of Würdemann's Case II.)

The macroscopic specimens are of an eyeball normal in size and shape, and in relation to ocular structures, except as shown. Especially noticeable are the venæ vorticosæ and the chorioidal fetal cleft. (See Fig. 3.) This is the larger section, the eye being cut a little out of the median line, although through the center of the tumor. The latter is the size of a large pea, arising from the chorioid near the ciliary body, at the lower portion. The growth is white, although covered by the dark pigment coat of the chorioid and the retina. It has as yet disturbed none of the intimate relations of the ocular structures, except the chorioid and retina. The latter is detached back to the optic disc, this space being filled by a subretinal

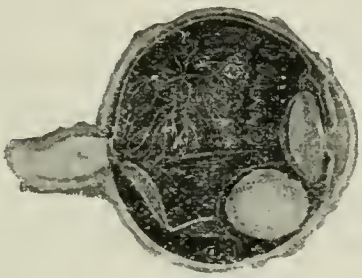


Fig. 3. Lateral half of eyeball with sarcoma of the chorioid, showing normal relations of the ocular structures and the tumor.

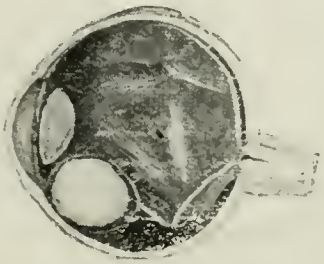


Fig. 4. Lateral half of eyeball with sarcoma of the chorioid, showing extensive retinal detachment and the tumor.

exudate which in section appeared of a colloid nature, and of a firmer consistency than the vitreous.

In the opposite section, the retina is extensively detached by reason of the exudate, and thrown in folds. It retains its normal appearance in other respects, and the macula lutea shows distinctly to the naked eye. (See Fig. 4.)

The microscopic section shows that the tumor is made up almost entirely of typical non-pigmented, small round cells, there being but little connective tissue stroma. The chorioidal tissue itself is entirely replaced by the new formation. The sarcoma cells are limited to the tumor itself, none being found in the vitreous or other structures, which retain their normal microscopic appearances. The subretinal exudate is of a homogeneous colloid nature.

June 24, 1902. The patient is alive and has had no recurrence of sarcoma growth.

CASE II. June 21, 1900. Mr. K., aged 52, of Milwaukee, Wis., manufacturer, (referred by Dr. L. Webster Fox, of Philadelphia), negative general history except that he remembered receiving a blow upon the left side of the head about a year before; since that time and a few months ago had noticed that the sight of that eye was failing; no history of pain or inflammation; *stat. præs.*—strong healthy man; eyes: R., V. — 5/VIII; refraction, R., + .25 ⊃ + 1.00 — 180° = 6/VI add + 2.25 for near; L., V. = fingers 1 m., could see better downward; V. F. hemianopic, of the same character as in Case I; pupillary reflex normal; the ophthalmoscopic appearances were much the same as in Case I, there being a rounded bluish mass easily observable by oblique examination and by the ophthalmoscope. I did not hesitate to make immediate diagnosis of intraocular tumor of probable sarcomatous nature. He then acknowledged that Dr. L. Webster Fox, of Philadelphia, had seen him the week before and had made the same diagnosis and had referred him to me for operation. He also stated that he did not come direct to me and had been to a specialist in this city who told him he had "detachment of the retina," which, of course, was self-evident, but no diagnosis of the tumor was there given him. I advised enucleation at as early a time as possible. He did not return to me again until July 7th: during the interval he had been to several physicians in consultation, all of whom had given him the same diagnosis, with the exception of the one to whom he had been before, to whom he had had again gone and who insisted he had simple detachment of the retina. He finally decided that the opinion of the majority should prevail, but even then was suspicious that we might have been mistaken and insisted that the eyeball be put in possession of a friend at the time of the operation. I acquiesced in this idiosyncrasy and performed enucleation allowing his friend to take the eye in a sealed bottle. (This extraordinary procedure would not have been allowed were the diagnosis not so plain.) One week later the eye was frozen, divided in his presence and a marked circumscribed tumor was found, a little lar-

ger and more irregular than that which is illustrated in the first case, but springing from the same location, i. e., from the anterior portion of the chorioid in the lower half near the ciliary region; the retina was detached over and behind the tumor, there being a subretinal exudate of the same character. Microscopic section showed that the tumor was made up of typical pigmented, small-round-cells, there being considerable connective tissue stroma. The chorioidal tissue itself was entirely replaced by the neoplasm. The sarcoma cells were likewise, in this case, limited to the tumor itself, none being found in the other structures of the eye.

Of particular interest is the fact that there has been no recurrence of sarcomatous growth in either of these cases; case I. having been under observation 6 years, case II. for 2 years.

New growths of the uveal tract are relatively uncommon, occurring in 0,0375 to 0,066 per cent. of eye cases; of these sarcoma is relatively common and most often found in the chorioid itself, it is usually pigmented and its course is such that four distinct stages may be observed. If occurring in the chorioid in the first stage, the tumor is small and does not at first affect the visual acuity; it gives rise to defect in the visual field from circumscribed detachment of the retina. The diagnosis is usually readily made by the ophthalmoscope although not always upon first examination, as it is to be differentiated from simple detachment of the retina. As the tumor grows the retina becomes more and more detached from the chorioid, the space between it and the chorioid containing a thickened jelly mass infiltrated by connective tissue and ameboid cells but no tumor tissue. The growth itself is usually circumscribed, the chorioid remaining in contact with the sclera in its full extent. Externally the eye looks normal. There are as a rule no symptoms of pain or inflammation, which come on in the second stage, when the eye becomes blind and ophthalmoscopic examination is impossible on account of disturbances of the media. In the second stage symptoms of increased tension set in. In the third stage perforation of the eyeball and extra-orbital growth of the tumor occurs and in this and in the fourth or last stage the tumor grows ra-

pidly, filling the orbit, projecting out cauliflower-like excrescences and as a rule metastasis into other organs with death occurs.*

Sarcoma affects both the uveal tract and the orbit in males and females in about equal proportions. The average in uveal sarcoma is forty-eight and one-half years, and in primary orbital cases the growth first appeared, on the average, at twenty-eight and one-sixth years. There is but little tendency for one side to be affected more frequently than the other. In only four cases out of 103 was there history of tumors in near relatives. In three out of seven cases that recurred there were metastatic growths. Recurrence took place locally from a week to three years after operation. In every case in which recurrence took place the patient died of sarcoma. In the primary orbital cases recurrence was reported to have occurred in 58.6 per cent. The average time elapsing between operation and recurrence was twenty months. Stirling's† results show a difference between growths primarily affecting the uveal tract an those beginning in the orbit. In the former 8.86 per cent. recurred in the region of the orbit, and death in 32 per cent. was due to metastasis. In the latter, when recurrence took place at all, the orbit was always affected, even when other organs were attacked."‡

*Würdemann, Part VI in Posey and Wright's System Dis. of Eye, Ear, Nose and Throat (in press, 1902).

†Stirling, A. W., Sarcoma of the Orbit, Ophth. Rec., 1898. Vol. VII, pp. 331-336.

‡Würdemann. "A Study of Multiple Metastatic Angio-Sarcoma." Amer. Jour. Med. Sciences, June, 1899.

A REMARKABLE VASCULAR GROWTH INTO THE VITREOUS.

By J. E. Jennings, M. D.,

ST. LOUIS, MO.

ILLUSTRATED.

Mrs. L. J. C., a woman in good health, aged 72, consulted me Oct. 11, 1901, complaining of failing sight.

History: At thirty-five years, began wearing glasses for close work, otherwise sight was good. About five years ago, was considerably run down in health from nursing a case of scarlet fever. One day while engaged in laundry work she noticed a sudden blindness in the left eye, which her physician, Dr. Benj. F. Hall, of Rock Island, Ill., writes me was the result of hemorrhagic retinitis. According to the statement of the patient "vision of left eye slowly improved," though from the findings of my examination this is not at all likely.

About three months ago the vision of the right eye was noticed to be failing so that she was no longer able to read. Thinking a new pair of glasses might be of benefit she presented herself at my office.

Refraction. V. O. D. $^{5}/_{60}$ + 1.00 D. sph. = $^{5}/_{20}$.
V. O. S. counts fingers at one foot, if the hand is held to the temporal side.

Retinoscopy under homatropin. Right, + 2.00. Left, + 2.50.

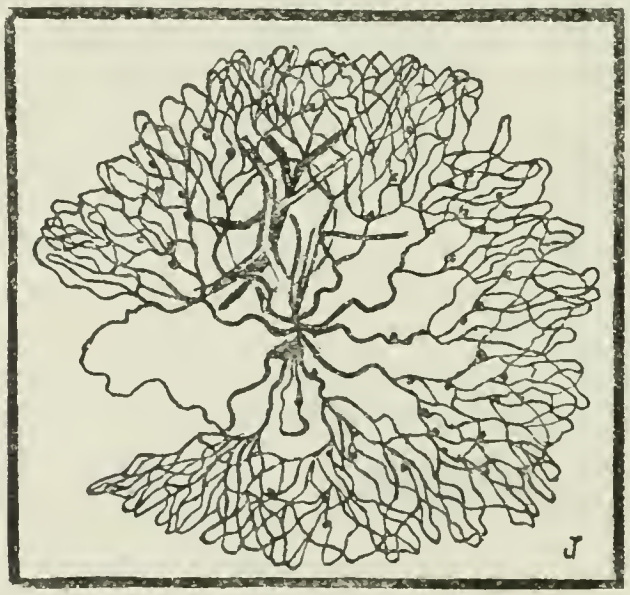
OPHTHALMOSCOPIC EXAMINATION.

Right eye. Media clear, optic disc possibly a little paler than normal, but no marked change observed. Retinal veins and arteries normal. No disease of other parts of fundus.

Left eye. By the *indirect method* a moving mass of vessels was seen which suggested detachment of the retina. By the *direct method* the optic disc and retina were found

to be normal and there were no evidences of retinal or vitreous hemorrhages.

At the temporal edge of the disc a macular branch of the retinal artery turned abruptly at a right angle and together with two vessels which issued from the depth of the nerve passed directly forward to a small patch of semi-transparent connective tissue situated in the vitreous $2^1/_2$ mm. in front of the disc. At this point the three vessels subdivided into a dozen or more tortuous branches which spread outward into transparent vitreous like spokes of a wheel. Finally these vessels anastomosed with one another (see figure), forming a beautifully, delicate and extensive meshwork of fine vessels. Situated at various points of



this meshwork, usually at the junction of two vessels, were minute patches of membranous tissue, represented by black dots in the drawing.

Heart and kidneys were found to be normal.

Treatment consisted in the use of $^1/_{12}$ of a grain of bichlorid of mercury with 5 grains of iodid of potassium, three times a day.

Nov. 6, 1901. The only change noted at this visit was an improvement in vision of the right eye from $^5/_{20}$ to $^5/_{15}$.

Dec. 31, 1901. Vision of the right eye improved to $^5/_{12}$.

Vision of the left eye was reduced to light perception. Patient said that about a week ago she noticed a web-like film in front of the left eye which, the next day, took the

form of a ball-like cloud attached at one point and moving about.

An ophthalmoscopic examination showed a dense haze of the vitreous so that only a faint outline of the disc could be obtained. With a + 8 D lens I could make out the small patch of connective tissue at the hub of the wheel, but, to my surprise, the beautiful meshwork of vessels had entirely disappeared with the exception of a few fine hazy lines no doubt remnants of the delicate walls of the empty vessels.

Vascular growths into a relatively healthy vitreous are extremely rare of the countless thousands of eyes examined by observers all over the world; since 1851 only about twenty cases are on record. A history of these cases is given by Dr. Wilbur B. Marple in a paper entitled, "A Contribution to the Pathology of Vascular Growths into the Vitreous," and published in the Transactions of the American Ophthalmological Society, 1901. The cause of these peculiar formations is, no doubt, hemorrhage into the retina and vitreous. The process is identical with retinitis proliferans in which new formed vessels are seen on the surface of masses of white connective tissue which develop into the retina and extend out into the vitreous. In retinitis proliferans, however, the condition is apt to remain stationary while in some cases of vascular growths without connective tissue formation the delicate vessels may ultimately disappear leaving a useful eye or, as in my case, the vitreous becomes disorganized and the sight is lost.

507 Carleton Building.

AMYLOID DEGENERATION OF THE CONJUNCTIVA.*

By L. A. W. Alleman, A. M., M. D.,

BROOKLYN, N. Y.

ILLUSTRATED.

The patient, the history of whose case is here presented, Rosalia Cascia, an Italian, 54 years of age, came under my observation in February, 1899, in the Long Island College hospital, where she had been sent by the United States Immigration authorities for detention, on account of the condition of her left eye.

Her own statement of the case, kindly given me by Dr. J. W. Tappan, Interne in Charge United States Immigration service, was that, several years ago, she lost one of her children, and cried a great deal; one morning she awoke and found the left eye red and swollen; it gradually grew worse, until it reached it present condition.

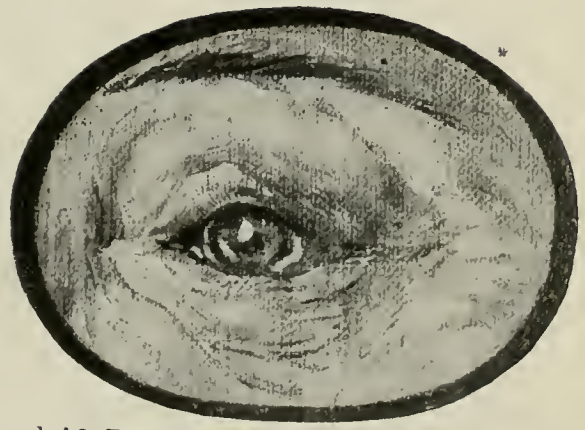
Even this meagre history is unreliable, owing to the patient's lack of intelligence, and to the misrepresentation by immigrants of all facts of their physical history, seeing in the questions some trap to exclude them from the country. She denied ever having had any pain in the eye previous to her arrival in this country, but she admitted that, of late, there had been some pain and photophobia.

PRESENT CONDITION.

The patient's physical condition seems to be good. She looks much older than her alleged years, but this is usual among immigrants of her class. The right eye appears to be normal and shows no evidence of trachoma, and there are neither corneal nor conjunctival scars.

The left eye presents a most unusual picture: both lids are enormously thickened and the palprebral fissure much narrowed. (See Fig.) The skin shows a bluish-red discoloration. No enlarged vessels are visible. On

*Read before the Ophthalmological Section of the Medical Society of the County of Kings, March 23, 1900.



Amyloid Degeneration of the Conjunctiva.

palpation, a hard mass is felt beneath the skin of the upper lid; this mass presents two prominences, with a central depression. The skin of the lid is freely movable over the mass, which is slightly resilient, but not compressible; nor is it movable, save with the lid.

The impression given to the examining finger is of a thickening of the tissues of the lid, rather than a new growth in the lid substance.

In the lower lid a crescentic mass is discovered, which seems similar to that in the upper lid.

The induration involves the major portion of both lids, and is thickest in the center of lids, and slopes off gradually toward the edges.

It is impossible to evert the upper lid, and an attempt to separate the lids produces slight hemorrhage. The lower lid can be pulled a little way from the globe, showing a shortened lower cul-de-sac.

The conjunctival surface is smooth and glistening, and looks as if tightly stretched over a waxy mass of an indescribable yellowish-red color.

The cornea is surrounded by a wall of similar appearance, which, save for the color, reminds one of the picture sometimes seen in extreme chemosis.

The cornea shows a small point of ulceration at its inferior temporal margin. The iris does not react to light, and an opaque lens prevents any examination of the interior of the eye. The globe is depressed by the mass above, and motility is restricted in all directions. No enlarged glands can be found in any part of the body.

An examination of the nose and naso-pharynx was made for me, by Dr. H. M. Smith, and no appreciable thickening of the lymphoid tissue in the pharyngeal vault, nor at the base of the tongue, was discovered.

A small portion of the diseased tissue was removed for examination. This operation occasioned little pain and but the slightest reaction.

Unfortunately, further operation or observation of the case was prevented by the death of the patient, which occurred a few days later, from pneumonia.

The portion of the mass which was removed was examined by Dr. J. H. Van Cott, who reported as follows:

"Herewith, I beg to report findings from my microscopic

examination of sections made by my colleague, Dr. Murray, from tissue removed from the conjunctiva of a woman in your care, in the Immigrant service, at the Long Island College Hospital. The tissue examined was removed by myself, from a markedly bulging portion at the inferior region of the inner canthus.

"In situ, it presented a pale, semi-translucent appearance and was fairly firm in consistence. Very little pain was occasioned by its ablation, with scissors, and only moderate hemorrhage.

"The microscope revealed a typical amyloid degeneration, originating in and around the arteries, capillaries and venules and extending to all the subjacent tissues.

"There was a small amount of round cell infiltration. No normal structures were found.

' Trusting this may be of service to you, I am,

"Yours faithfully,

"JOSHUA M. VAN COTT."

Amyloid degeneration of the conjunctiva, or, more properly, of the lid and subjunctival tissues, is a disease but very infrequently observed, at least, in this country.

Russia seems to be the habitat of this disease, and most of the recorded cases are from Northern Europe; yet, this case, occurring in an Italian, shows that it is not strictly confined to northern latitudes.

The disease is said to begin in the retro-tarsal fold and to pass over to the lid and eyeball.

The typical picture of a case of long standing, as given by Fuchs,* is as follows:

"The patient cannot open the eye, because the lids, transformed into large, misshapen swellings, cover it up. If the lids are drawn as far apart as possible, the wax-like conjunctiva is seen rising up under the form of a rigid prominence, all about the cornea, which latter is either clear or is covered by pannus. This swelling, belonging to the fold of transmission, protrudes between the lids and the eyeball, the plica semilunaris, also, is enlarged until it forms a misshapen mass."

The progress of the disease, in typical cases, is said to be very slow, and is attended with little inflammatory dis-

*Text Book of Oph., p. 99.

turbance. It attacks, as a rule, patients in middle life and, sometimes, is present in both eyes.

The degenerative process may be confined to a discrete mass or nodule, but it more often occurs as a diffuse infiltration.

Raehlmann,* who has made a very careful study of the disease, makes out a clear clinical picture, which has been further amplified by Kubli.† Kubli agrees with Raehlmann that the disease is a purely local affection and usually begins in the upper fold and neighboring portions of the tarsal conjunctiva, where the normal subconjunctival tissue most nearly resembles adenoid tissue.

The disease passes through four stages:—

1. Simple adenoid proliferation in the sub-conjunctival tissue.
2. Hyaline degeneration.
3. Exquisite amyloid degeneration.
4. Calcification and ossification.

First Phase. (Kubli) "Consists in a proliferation of pure adenoid tissue in the sub-mucus layer of the conjunctiva, or, in other words, hypertrophy of the normal adenoid tissue of the region." "In appearance, if the neoplasm is poorly supplied with vessels, it is generally of a bright yellow, glassy color and of a coarse, but very elastic consistency; but, if highly vascular, its color varies from an indescribably diaphanous reddish yellow to a reddish brown, with a delicate, elastic consistency," etc.

Second Phase. "Is characterized by the smooth and glistening surface of the tumor. When slightly vascular, the tumor is generally brownish yellow and wax-like, with numerous vessels unmistakably diaphanous. The tumors in this phase are harder than those in the first phase and more elastic than those in the third."

Third Phase. "Is characterized by a few, but important, symptoms. The color of the tumor remains about the same; it varies in consistency from hard to gelatinous, but, even in the latter condition, the tissue is not elastic."

Fourth Phase. "Is characterized by calcification and

*Arch. Oph., X, p. 171; XI, p. 446.

†Arch. Oph., X, p. 149.

ossification, in addition to pronounced amyloid degeneration, as in the previous phases."

These calcified or ossified portions, Kubli remarks, are often overlooked, as they may lie deep in the tumor, and are only discoverable on section, and are then not always visible to the unaided eye.

The picture as here given is sufficiently definite, to be easily recognizable, clinically, yet it is difficult to include all the cases reported under this head, in the same group. Dr. Chas. Steadman Bull* has described a case of "Amyloid Infiltration of the Lid and Orbit" of an active inflammatory type, which occured in a child $4^1/_2$ years old, of Spanish parents, and markedly strumous. It began about three weeks before the case presented itself, with a slight redness, and swelling of the outer part of left upper lid, and when first seen appeared to be a low grade cellulitis of the lid and its attachments. The swelling gradually increased until it occupied the entire lid and invaded the orbit, depressing the globe and causing exophthalmos.

The child complained of pain in the orbit and forehead, and showed a decided rise in temperature. After the case had been under observation for about 5 weeks a deep incision was made, through the tissues of the lid and orbit, but no pus was evacuated and the hemorrhage was but a few drops, and this mostly from the vessels of the skin. The child died several weeks later, but no autopsy was obtained. The tissue removed at the time of operation, gave the reaction of amyloid tissue, and proved on examination to be infiltrated.

The infiltration involved the vessel walls and extending for some distance into the connective tissue.

Amyloid degeneration of the conjunctiva has been held by many authors to be a result of trachoma. A review of the reported cases shows clearly that trachoma does not necessarily precede this condition, and considering the prevalence of trachoma among the class of people, in whom amyloid disease has been observed, it would indeed be surprising were they not frequently found co-existing; but I fail to find any evidence of a casual relation between the two conditions.

*Transactions of the American Oph. Soc. Vol. II, pp. 411.

A MODIFICATION OF THE ABNEY PELLET TEST FOR THE READY DETECTION OF CENTRAL SCOTOMATA.

By Charles A. Oliver, A. M., M. D.,

PHILADELPHIA, U. S. A.

ILLUSTRATED.

Some two years ago while preparing an extended monograph upon the general question of normal and subnormal color-perception, I chanced upon the following paragraph in Abney's well known "Lectures on Colour Vision".*

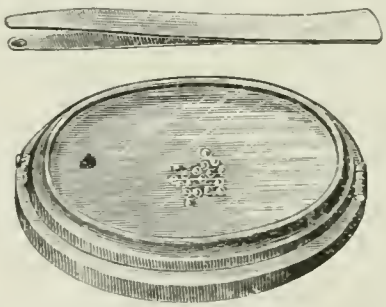
"With the wool test, which we shall describe later, it is the commonest thing possible for colour-blind persons who have a central scotoma to match accurately the different test-skeins, for the reason that the images of the skeins of wool are so large that they are received on the parts of the retina which are not diseased. These same colors, however, if presented to them in small patches, will inevitably show the defect in vision.

"With this end in view, I have had a set of brick-clay pellets some $^3/_{16}$ inch in diameter, painted with water-colours mixed with soluble glass solution of the same colours as the wools. These are placed in a shallow tray, and presented to patients affected with this central colour blindness to pick out all the pellets which match reds and greens. They will tell you that they see neither one nor the other, though they will pick out the blue pellets unerringly. A red pellet they will match with a red, green grey, or a brown one, and a green one with the same. If, however, you instruct them to direct their eyes a few degrees away from the tray, they will tell you they see all the colours, and as they endeavor to pick them out, they, with a natural instinct, direct their eyes again to the collection, when once more the colours vanish. It is almost pit-

*"Colour Vision: Being the Tyndall Lectures Delivered in the Royal Institution". By Capt. W. de W. Abney, C. B., D. C. L., F. R. S., 1895. (pp. 146–147.)

eous sometimes to see the distress which this simple test occasions. The sight of the colours for an instant and their immediate disappearance in the cases that I have tried, seem indicative of something terrible, for they usually have no idea of the cause of this (to them almost miraculous) phenomenon."

At once seeing the advantages of such an ingenious test, I began a series of experiments with a number of contrivances kindly devised for me under my superintendence, by the opticians, Messrs. Wall and Ochs, of this city, resulting in the obtainment of an apparatus which I have successfully employed in a great number of ordinary clinical cases—revealing in a moment or two the presence of central color scotomata; and thus enabling me without the loss of valuable time to take a choice of cases that were appropriate for later extended field-estimation.



As can be seen in the sketch, the contrivance practically consists of a wooden disc, upon the upper surface of which definitely tinted spherical pellets are loosely laid, the whole being covered with a transparent lid. The disc which has been painted dead black and which is ten centimeters in diameter, is constructed like a plano-concave lens, with its upper concave surface made equal to the curvature seen in a minus spherical lens of four diopters' strength. The lid, which is of clear plane glass, surrounded by a bevelled rim of blackened metal, is hinged upon the disc base and is fixed in position by a metallic push spring-clip. The pellets, each of which is four millimeters in diameter, are composed of ivory, and are definitely gauged in their relative tintings to equal degrees of color-saturation.

A pair of ingeniously contrived forceps so fashioned that each pellet is most easily held in position when once grasped, accompanies each box.

The plan of procedure that I have found most useful is to employ but one eye at a time, taking care that the unused one is excluded from participation in the test. The apparatus, placed upon some broad black surface such as a large dead-black table cloth, is then brought into view.

The green pellet is removed from the rest of the color pellets in the color tray and laid upon the cloth alongside of the forceps. The color tray with the remaining pellets is left open and exposed. The patient is shown the separated pellet and the forceps. Nothing is said to him in regard to the name of the tint of the color. He is than requested to pick up the pellets with the forceps and hold it in the position before him at which it seems the brightest and the plainest. If he holds it excentrically or turns his head to one side in order to better see the pellet, his defect will become quite evident. He is then asked to hold his head in such a position that his exposed eye is situated at some forty to fifty centimeters' distance directly above the color tray. While in this situation he is made to drop the pellet among its fellows in the color tray. The moment that the pellet has been placed in the tray the box is given a slight twist so that the pellets will be made to assume new relative positions. This done, the patient is requested to select the pellet from among its companions. If he has a central scotoma for green of but a couple of degrees in diameter when the test tray is held in this position, it will be almost impossible for him to regain the green color pellet—thus again objectively showing the central field defect for the perception of green and at the same time objectively proving its existence. The test is to be repeated with the fellow eye, and if desired, with the red, the blue, and the yellow series of pellets.

If the presence of the color scotoma has been thus quickly and crudely proved by this simple clinical procedure, careful perimetric studies in order to estimate the size, the shape, and the degree of color saturation of the scotomatous area can be immediately established and consummated.

ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC LITERATURE.

BY

CHARLES H. MAY, M. D.,

NEW YORK,

(Quarter ending June 30, 1902.)

A Plea for the Early Treatment of Squint.

BLACK, NELSON MILES, Milwaukee, Wis. (*The Journal of the Amer. Medical Association*, May 24, 1902.) The writer calls attention to the indifference displayed toward the treatment of squint by laymen and sometimes by physicians, due largely to the prevalent idea that the child will outgrow it, is too young to be treated, or will always have to wear glasses. He shows the fallacy of these ideas and explains the advantages of the earliest possible treatment of the squinting eyes of children:

"1. In rare instances in some cases the squint disappears as the patient grows older, but nearly always with vision much impaired in the deviating eye and binocular vision very imperfectly developed.

"2. The earlier one can get a case after he has commenced to squint, the better the prognosis as to the parallelism of the eyes, binocular vision and visual acuity of each individual eye, because the case is in the developmental stage.

"3. In regard to wearing glasses, the contrary is true. If a case can be obtained for treatment soon enough after the squint is noticed, the glasses, in the majority of cases, can be laid away about or soon after puberty, being only needed for close application of the eyes, except, of course, in cases of high hyperopia, myopia or astigmatism.

"These deductions are reached through the latest theory advanced by Mr. Claud Worth of London regarding the etiology of squint, i. e., that the potential factor in the cause of squint, of course taken together with the sev-

eral other etiologic factors, as hyperopia, myopia, anisometropia, congenital amblyopia, fundus changes, changes in the refractive media, heredity, local changes in an ocular muscle, etc., is the defective or non-development of the fusion sense."

This defect or non-development of the sense of fusion depends upon the fact that the various errors associated with squint are responsible for visual sensations of varying intensity in the two eyes, causing a disregard of the poorer image and following this a convergence or divergence; this happens while the fusion sense is being developed; the squinting eye becomes more and more amblyopic from disuse. The cases in which none of the etiological factors are present and yet the child squints are explained by the occurrence of some fright or illness which interferes with and disturbs the partly developed fusion center. The fusion sense, Mr. Worth has determined, is fully developed by the sixth year; after that the question of establishing it is almost beyond hope.

"The factors to be dealt with in a case of squint are: 1. The deformity. 2. The suppressed vision of the deviating eye. 3. The more or less amblyopic condition of the deviating eye in the majority of cases. 4. The refractive errors. 5. The fusion sense."

The first step consists in the correction of errors of refraction. In children who are not old enough to know their letters, Mr. Worth estimates the acuteness of vision by the aid of five small ivory balls varying from $^1/_2$ to $1^1/_2$ inches in diameter, in the following manner: One eye of the child is covered and the ivory balls are thrown upon the floor; if, at 5 meters, the child can go directly for the smallest ball, vision is, approximately, normal.

Errors of refraction are determined under a mydriatic, by skiascopy, and correcting glasses prescribed; these can be be placed upon very young children—even babies of 18 months tolerate them.

To exercise the deviating eye and prevent amblyopia, from disuse, a drop of atropin solution is instilled into the fixing eye each morning; the child will then fix for near objects with the deviating unatropinized eye and use the atropinized eye for distance. When the vision of the

deviating eye cannot be made to compete with the fixing eye, continuous occlusion must be resorted to in order to bring about central fixation. If the loss of the latter is recent, two or three weeks is usually sufficient to restore central fixation; in neglected cases, of long duration, where central fixation has been lost for a long time and the eye is quite amblyopic, much improvement cannot be expected, although surprising results sometimes follow.

"The fusion faculty is next exercised by the ingenious instrument devised by Mr. Worth, called the amblyoscope. This instrument consists of two halves joined by a hinge, each half consists of a very short tube joined to a longer one at an angle of 120 degrees; a mirror being placed at the chord subtending the arc of this angle; an object glass is placed at the free end of the longer tube, at the free end of the shorter tube is a lens, the focal length of which equals the distance of the reflected image of the object glass at the end of the longer tube. 'The two halves of the instrument can be brought together to suit a convergence of the visual axes up to 60 degrees, or separated to suit a divergence of as much as 30 degrees.'

"The pairs of object slides are drawn on translucent paper and stuck on glass slides. These are of three classes. The first class consists of pairs of devices, such as a bird and a cage, a mouse and a trap, etc. These require no blending of images, but only binocular vision. The second class consists of devices, part of which are on each slide, so that a blending or fusing of the images must take place in order that the full picture may be seen. The third class consists of stereoscopic pictures, which, when combined, give an impression of perspective."

The use of the amblyoscope is thus described by Mr. Worth: "The child, with his correction on, is held on the surgeon's knees and the amblyoscope roughly adapted to his degree of deviation; it is then held before the child's eyes and an electric lamp is put in the axis of each tube, about four feet away. By a simple mechanical arrangement each lamp is easily brought nearer to or put farther away from the tube which it illuminates. A slide showing a cage, for instance, is put in the tube before the child's fixing eye, and a bird in that before the squinting eye,

and the child is told what to look for. At first he sees only the cage. The lamp before the fixing eye is then taken farther away, and that before the squinting eye is brought nearer, until the child sees the bird. By this time he has lost sight of the cage. The intensities of the illuminations are then adjusted until the child sees both the bird and the cage. The child is then allowed to grasp the instrument and, assisted by the had of the surgeon, is taught to vary the angle of the instrument so as to make the bird go in and out of the cage. Many other similar pairs of slides are shown. The average child of $3^1/_2$ or 4 years of age takes a very keen interest in the game, which he imagines has been devised merely for his amusement. Slides which require a true blending of the images are then shown. After a time it is often found that the angle of the instrument may be altered to a very considerable extent, either in convergence or divergence, while the eyes follow the objects and maintain fusion of the pictures. One often gets a powerful 'desire' for binocular vision in these young subjects with surprising facility. The next step is to equalize the intensities of the lights. This may usually be done at this stage without a return of suppression. In many cases one is able to deviate the two halves of the amblyoscope more and more at each visit until parallelism of the visual axes is obtained. In other cases, operation may be necessary. If, then, the eyes are placed approximately straight, the desire for fusion will fill up any slight gap that may remain. However the actual remedying of the deviation may be effected, if the child has this powerful desire for fusion, which can only be acquired in early childhood, a perfect cure of the squint results. The child will then, in the majority of cases, be able, after a time, to lay aside his glasses, except for reading." * * *

The use of the stereoscope, with properly selected pictures, will greatly aid in the exercise of the fusion center after the visual axes have become parallel or the eyes have been straightened by operation, but is is of no avail before the visual axes are approximately parallel; Würdemann's modification of Kroll's orthoptic exercises is recommended for this purpose. The special points of the Worth amblyoscope are thus summarized: "1. It is adapted for use during the continuance of a squint of any degree; 2, the

suppression of the vision of the deviating eye is quickly overcome by the unequal illumination of the object slides, instead of by the slow and painful method, recommended by Javal and others, of continuous occlusion of the better eye for months or a year at a time; and, 3, the variety of the pictures amuses and interests the child so, he will give all the help he can."

Cosmetic Considerations Not the Only Ones in Cases of Strabismus—The Importance and the Possibility of Securing Binocular Vision.

DERBY, RICHARD H., New York. (*Medical Record*, March 29, 1902.) The writer calls attention to the dependence of visual and cosmetic results, after squint operations, upon orthoptic treatment, which he has observed is not often made use of by ophthalmic surgeons; such ocular exercise, practiced before the operation, tends greatly to add to its success, and, carried out after the operation, materially increases its effect; patient orthopic treatment, especially in children, can do much to ameliorate the condition when the strabismic eye is amblyopic.

The amblyopia in cases of monolateral squint has been described under at least three different forms. In the first the acuity of vision is diminished, but there is no change in the conductibility of the retinal elements. The condition is one of dullness of the retina. Again, there is a form of amblyopia in which the power of fixation is impaired. The patient makes tentative movement with the macula, which seems to be losing its predominance over neighboring portions of the retina. In the third form the inner half of the retina has better vision than the fovea.

In the first form it is common enough to have an improvement of the vision after the tenotomy. In the second form the improvement is not immediate, but comes gradually. In the last form the chances of improvement of the vision are small. It is in the second category of amplyobia, and especially in the case of young children, that results can be secured by the treatment.

Of the first importance is the complete correction of the refractive error. While, in practice, I have learned to depend largely upon the ophthalmoscope, the ophthalmometer and the use of glasses in estimating the refraction, it is not so with the strabismic child. Nothing less than re-

peated and complete atropinization is safe here. The ametropia once corrected, the isolated training of the amblyopic eye should be begun. To this end, the closely fitting screen over the well eye is necessary; and, for a half-hour at a time, daily, and in some cases twice in the day, the deviating eye is to be exercised. Exercises in reading and writing, under these conditions, are to be insisted upon.

Derby gives the histories of two patients, illustrating the advantage of daily exercise, and, continuing, says: "A most important step in the orthoptic training of the strabismic eye is the effort to revive in the patient a desire for binocular vision, and thus recall to the eye its faulty position. The use of the red glass before one eye will, in some cases, provoke diplopia, or a prism with its base up or down before one eye will often cause double vision. It is, however, especially the stereoscope that develops the desire for binocular vision. It is the fusion of the double images in every direction of the axis of vision that is the absolute cure of the strabismus.

"It is, perhaps, needless to say that in using the stereoscope we are not concerned alone with the convergence of the eyes, but with the accommodation as well, and as the strabismus itself consists in an alteration of the relations between accommodation and convergence, we must first correct the ametropia.

"The stereoscope that I continue to use, and which has been elsewhere described, permits the placing of the half-pictures at any point that may be required to meet the faulty position of the strabismic eye. If this eye has a visual acuity of less than two-tenths, it may be well that but one half-picture at first be seen, or, if at all seen, that it soon disappears. With children, my practice is to use the familiar cards "Jockey" and "Horse." According to the position of the eye, the horse is perhaps seen, and for an instant its rider. The jockey is, perhaps, on the tail of the horse or on his neck, and the half-pictures must be either approximated or separated to meet the faulty convergence or divergence of the visual axis of the deviating eye. This stereoscopic exercise is to be followed daily, and the actual lateral distance of the half-pictures from the median line noted. Together, hand in hand with

this exercise, the monocular exercise of the amblyopic eye should be continued.

"It will be said that it is difficult to make a patient take any interest in the training of an amblyopic eye when the vision of the other is good and there are no asthenopic symptoms that do not disappear when the refraction is corrected. This may be true, and doubtless in the one-sided amblyopia of hypermetropes of sixty and over we find many who have never had any inconvenience from it. But the cases that I have cited are those of children, and many other similar ones might be adduced. In his "Manuel de Strabisme," Javal brings forward many such cases. This author, whose views are entitled to the highest respect, says of the amblyopia ex anopsia that he recalls no case of a child under six years of age where central fixation had been sacrificed (p. 239). If this be true—if there is a period in child life when systematic exercise of the amblyopic eye may result in improved acuity of vision, should we not in all cases see to it that the weak organ be made strong and the infinite advantage of binocular vision be secured?"

Insufficiency of Divergence as an Etiological Factor in Concomitant Convergent Strabismus—Its Importance, Determination and Treatment.

WOTTON, HERBERT WRIGHT, New York. (*Archives of Ophthalm.*, March, 1902.) The writer states that a case of permanent strabismus may present, at the time of examination, all or several of six etiological factors, i. e., abolition of the function of single vision; monocular amblyopia; hypermetropia; spasm of convergence; possibly, though, he believes, but rarely, a spastic shortening of one internus and a secondary insufficiency, or abolition, of the function of divergence. The paper then proceeds to deal with the secondary insufficiency of divergence, the importance of which is considered to be very great indeed, for it is present in the vast majority of permanent cases and, when present, *seems* at least to be the only factor requiring operative interference. The writer holds that divergence, as well as convergence, is an active function, thus agreeing with Duane and opposing the theory of Hansen Grut, and advances certain proofs to support his position.

He then attempts to show that a secondary insufficiency of divergence is accountable for the maintenance of the angular deviation in most cases of permanent strabismus which have resisted the prolonged influence of their full correction, and believes that it acts in part directly and in part by permitting a continuance of the convergence spasm, after a proper proportion between convergence and accommodation has been restored. He regards this secondary insufficiency as structurally paretic in nature, depending upon an actual atrophy of the externi, caused by their long disuse in effecting the function of divergence, or, more accurately, in maintaining parallelism, and states that the field of fixation shown by such cases is identical with that exhibited by mild degrees of paresis of both sixth nerves. He believes that a spastic contraction of the internus of the squinting eye, if it exist, has little to do with the limitation of the external rotation or, for that matter, with the maintenance of the angular deviation.

Although he holds that a secondary insufficiency of divergence exists in the vast majority of cases of permanent squint, he states that it is not present in all, not even in *all* of those of considerable duration, and gives the reasoning which he employs to determine its presence. Thus, for the most part, it is not present in recent cases, nor in those in which the deviation is manifested only during near vision, nor in cases of periodic squint, with rare exceptions; nor, again, in those cases in which the deviation ceases to exist with the employment of the full correction. It is to be diagnosticated with the greatest certainty in those cases in which the deviation still persists during both distant and near vision after the prolonged use of the full correction, and in which the external rotation of each eye, when tested separately, is then found to be sub-normal. He places great dependence on the examination of the field of fixation in these cases, but states that its value is always comparative and its findings only of the greatest importance where a distinct, relative limitation of the external rotations is manifest. Believing, as the writer does, that, with the rarest exceptions, the insufficiency of divergence found in convergent strabismus is a condition secondary to the original convergence

spasm, he states that it is naturally apt to be most marked in cases of considerable duration, in adults or adolescents who have squinted since childhood. It is not invariably found in these cases, however, and it is exceedingly common in children of seven years and upward, while, exceptionally, very recent cases will exhibit it to a marked degree.

In regard to treatment, he strongly advocates the advancement of both externi to the corneal margin, without tenotomy of the interni, in all cases of permanent strabismus in which a secondary insufficiency of divergence is present, states that there is no danger of a secondary divergent deviation in such cases, and that, when done according to this indication, the results of this operation are truly brilliant.

Functional and Paralytic Strabismus.

Roosa, D. B. St. John, New York. (*Medical Record*, May 3, 1902.) The writer calls attention to the correctness of the term "functional strabismus" for concomitant squint, as proposed by Panas, and the objections to the term "monolateral squint" except in cases of paralysis.

"Strabismus was in many quarters supposed to be an effect of the weakness of the muscles, and the origin was not sought beyond their action. Indeed the muscles themselves are often examined as if they were the primal cause of strabismus. Functional strabismus is no more caused by weakness of the muscles than is nystagmus. The old error of mistaking an effect for the cause is at the bottom of the erroneous theories about the origin of strabismus. Except in paralysis, the muscles are as strong as in eyes in a proper state of parallelism. It is only the fixation power that is weakened or lost, and that is from what may be termed central causes. I am very far from denying that a muscle may become weaker after long disuse, or after it has been divided and haggled in an operation for convergent strabismus, so that the fibers are not again united. It may then scarcely have any power. We often see this in that form of divergent strabismus depending on a failure of an operation for convergent squint. After such a muscle is fished out and advanced and reattached, I have had occasion to see the growth of its fibers in cases where the operation was repeated a year after. But what

I mean to affirm is, that in ordinary functional squint, the weakness and improper action of the muscles, whether it be more or less, is due entirely to the condition back of them which causes the strabismus. This is just as atrophy or shriveling of the muscles of one side of the body may occur as the result of a central lesion which prevents the muscles from action. It would be absurd to speak of this condition as the primary cause of the inability to walk or to use one side of the body, since that disability resulted as soon as the cerebral hemorrhage occurred, and it is as great, if not greater, the moment after the hemorrhage which produced the hemiplegia, as it is when time has allowed the unused muscles to be lax and, perhaps, become atrophied.

To speak of monocular strabismus, excepting in paralytic cases, is a glaring fault in nomenclature. Among other evidences of the elementary state of knowledge as to the nature of strabismus, is the fact that so much is said directly and by inference, even to this day, of monocular strabismus, 'of the eye which squints,' and other terms to indicate that only one eye is at fault. I long since endeavored to show that all functional squint is concomitant, and I have repeated this observation in other places, and that there is, consequently, no such thing as monolateral squint, where the muscle is not paralyzed. Yet, even men more or less expert in ophthalmology in my clinic, often ask me as I am about to operate on a case of strabismus, 'Which is the squinting eye?' Some of these inquiriers really intend to ask, 'Which is the eye that, as a rule, or generally squints?'

"Panas, proposing his new operation on both muscles at one sitting, said in his article: 'The conception of the unilateral character of strabismus, while it is true of the paralytic variety, or that due to contraction of the muscle, is absolutely incorrect as to that which concerns concomitant strabismus,' and he then gave the proper name of functional to concomitant strabismus."

The Act of Vision.

DODGE, RAYMOND, Weslyean University. (*Harper's Magazine*, May, 1902, in *Medical Press and Circular*, May 28, 1902.) As this writer points out, it is but "a little over a year ago it was demonstrated that while the eyes

are moving, as we look from one point to another in an ordinary complex field of view, we can distinguish none of the impressions the eyes receive." Mr. Dodge points out that in moving the eyes across the page in reading, the progress is never continuous: it is interrupted by a series of stops. We have actually no power of moving our eyes slowly, and as is now well known, distinct vision requires exposure to the retina for an appreciable fraction of a second, we are actually blind to all external objects while the eyes are moving, and only see during the stops. He consoles the average reader whose envy has so often been excited by thinking of the intellectual genius who can take in two or three lines of print at a time. Such a feat must now be forever relegated to the lumber-room of stale miracles. The man of exalted mental powers may be able to read very fast, but while his eye is performing the sweep he never takes in even a single word. "More serious are such moments of blindness to the boxer or the fencer. Empirical expediency long ago developed the maxim that both should fixate the eyes of the opponent. This is not merely to avoid giving cues of intended movement, but also to avoid the disastrously numerous moments of blindness which would result if one attempted to follow the motions of the opponent's hands." The writer points out an interesting physical fact which has probably not been noticed by some of our readers: "All of us see a reflection of our eyes in a mirror many times a day, but none of us ever saw his own eyes move." The fact that we can see our heads move, frequently produces "the illusion that we see our eyes during a movement of the point of regard."

The Manner of Making an Iridectomy in Acute Glaucoma.

BURNETT, SWAN M., Washington, D. C. (*The Amer. Jour. of Ophthalmology*, April, 1902.) The writer points out the difficulty of making an iridectomy in acute glaucoma as usually done either with the triangular knife or the Graefe knife: "when the anterior chamber is abolished, or practically so, and the iris has been reduced to a narrow rim, or may be lost sight of under the scleral edge of the cornea, these procedures are either impossible, or at least fraught with the greatest danger to the lens."

In such cases he has escaped difficulties by making use

of a modification of the Streatfield incision for cataract extraction, which consists in opening the anterior chamber with the point of a cataract knife, held at right angles to the surface of the ball, and following the curve of the base of the cornea for the extent of the opening desired. Burnett makes an opening into the anterior chamber from without, by successive strokes with the point of a Graefe knife, following the curve of the corneal base and far behind the clear cornea as is desirable for the most peripheral position of the wound, cutting the layers at the sclero-corneal junction as evenly as possible; the bottom of the wound thus carefully made finally gives way at some point, and through this opening there is a gush of aqueous and usually a prolapsed iris. A triangular knife with a bulbous point is then introduced into the wound and the section of the already thinned tissue completed; the bulbous point protects the lens and cornea from any injury. A short, thin, straight knife with a bulbous point can also be used for the same purpose, or even a blunt-pointed scissors. The iris is seized with the forceps and cut in the usual way. Bleeding is done away with by the use of suprarenal solution. A special knife having the shape of a hatchet with a slightly rounded cutting edge of 3 or 4 mm. length might be specially constructed, but the writer has found a rather short, stout Graefe knife quite sufficient.

On the Protection of the Cornea in Some Sightless Stumps.

GIFFORD, H , Omaha, Neb. (*Archives of Ophthalmology*, March, 1902.) There exists a rather large class of cases in which the patient comes to the oculist with a perfectly quiet stump over which a small shell cannot be worn on account of the irritation of the cornea; or on account of the danger of irritating and infecting exposed bits of iris tissue; or where the stump is irritable solely from the degeneration of the corneal epithelium.

In all of these cases the writer has been accustomed to cover the cornea either with a conjunctival flap, a Thiersch flap, or an epithelial lip flap; one or the other of these operations does excellent service in doing away with the necessity for a more radical operation and in preserving the best kind of support for an artificial eye, and is

readily accepted by some patients who will not consent to evisceration or enucleation.

In the majority of such cases, he uses a conjunctival flap in the following manner: "The membrane is excised around the lower half of the cornea for an area about $^3/_{16}$ of an inch wide at the sides, and $^1/_8$ inch below. Above this zone the membrane is dissected free from the globe as far as the upper fornix, in the neighborhood of which a cross cut is made through the membrane to allow it to be slid down over the cornea without putting too much tension on it. Three sutures below are generally sufficient, but these should be put well into the episcleral tissue, nearly as deeply as in advancement of one of the straight muscles. This method is preferable to a dissection of the conjunctiva above and below and suturing across the center of the cornea, since in the latter case two little raw surfaces from each side are brought into contact, and as soon as the stitches come out the conjunctiva slips back, re-exposing the cornea; this explains the necessity for putting the stitches into the episcleral tissue after denuding the sclera below the cornea, so that the tension on the upper flap does not pull up the conjunctiva from below and thus place the line of sutures across the cornea.

"Where, from any cause, the conjunctiva is atrophic and the space for an artificial eye would be too much limited by the operation just described, I use an epithelial lip flap (i. e., a thin flap shaved from the lip with a razor) or a Thiersch flap. The conjunctiva having been dissected up for $^1/_8$ of an inch around the cornea, and the cornea having been scraped (especial care being taken in the neighborhood of the limbus), the flap is spread out carefully over the cornea and tucked under the loose conjunctiva on all sides. It is well to bandage both eyes for twenty-four hours after these operations. I have used the Thiersch flap for this purpose only once, because, although it healed on perfectly, the accumulation of dead epidermis on its surface caused some irritation and I scraped the skin flap off and substituted a lip flap for it. I think, however, that the irritation could have been avoided if the patient had wiped off the dead epidermis once or twice a week (as I have since learned to teach other patients to do, where Thiersch flaps have been substituted

for conjunctiva in other sorts of operations); and the ease with which larger Thiersch flaps can be obtained, inclines me to give them another trial when a nearly full-sized cornea requires to be covered."

Implantation of Wire Ball Within the Orbit.

LANDMAN, OTTO, Toledo, O. (*The American Jour. of Ophthalmology.*, May, 1902.) "The ball consists of seven vertical complete circles of silver wire and three horizontal complete circles soldered at their intersections. The wire is about one thirty-second of an inch in thickness; although this is immaterial, so long as the ball is substantially made. Three sizes can be used—eleven, twelve or thirteen millimeters in diameter. The eleven millimeter ball will serve in almost any case.

After enucleation or evisceration in the usual way, the ball is introduced with ordinary dissecting forceps, and is held within the sclera or Tenon's capsule and covered with the tissue by means of three or four sutures passed freely through the tissues, conjunctiva and muscles, and securely tied. A coarse black silk suture is to be selected, which will avoid cutting through the parts. The advantages of this form of ball are: Its lightness; the ease with which any jeweler can make one; it obviates the the necessity of any specially devised instrument for introducing it, as in the case of smooth metallic spheres; of *most importance* is its solid *retention* within the tissues by granulation tissue springing up between the wires and binding the ball down permanently. The smooth metallic balls are often extruded, because there is no such arrangement in them to anchor them. The wire ball forms an excellent movable stump, without any sinking in."

Simple Method of Suturing the Tendons in Enucleation.

TODD, FRANK C., Minneapolis, Minn. (*The Ophthalmic Record*, May, 1902.) "While Mules' operation gives by far the best results, there are certain few cases where there are contraindications, or where, as in old people, enucleation being quicker performed, is selected. In these cases it is my custom to suture the tendons. The method which I use is simple, quickly performed and efficient.

Briefly described, it is as follows: After severing and dissecting up the ocular conjunctiva in the customary manner the superior rectus is picked up on a hook, a

curved needle is passed from without inward, through the conjunctiva and tendon, and out again through the tendon and conjunctiva; thus forming a loop which includes tendon and conjunctiva; the tendon is then severed near its scleral attachment; the internal is picked up with a hook, and the same thread carried on in the same manner through the conjunctiva and tendon, after which the tendon is severed. The same thread is carried on around in the same way throngh the inferior rectus and external rectus and their tendons cut; the optic nerve is severed and the globe removed. The two ends of the thread are then tied, and the tendons and conjunctiva are thus brought together with a purse-string suture. Scarcely any more time is required to perform this operation than when sutures are not inserted."

Resection of the Cervical Sympathetic Ganglia in Glaucoma; Its Present Status.

MARPLE, WILBUR B., New York. (*Medical Record*, May 10, 1902.)

Attention is directed to the unsatisfactory result in the treatment of many cases of glaucoma, no improvement being effected in quite a proportion of cases, and blindness resulting in ten per cent. or more. An effective therapeutic resource would, therefore, be most welcome. The writer refers to the experiments by Wegner, to the recommendations of Abadie, and to the resort to this operation for glaucoma by Jonnesco, in 1897. He has made use of Ziehe's report of 74 cases (1900) and has added 12 others; these 86 cases furnish the basis of his consideration of the legitimacy of the operation.

"The method of operating has already been frequently described in previous reports. Most recent operators go in back of the sternocleidomastoid muscle and content themselves with a removal of the superior ganglion, instead of taking away all three, as Jonnesco originally did. In the hands of a skilful surgeon, of experience, the operation is not one of great difficulty, nor is it a bloody one. Careful dissection is necessary, on account of the proximity of important vascular and nervous structures. It was predicted that the operation would have disastrous consequences, as well upon the general condition of the patient as upon the nutrition of the eye, but these proph-

ecies have not been realized. Neither cataract nor intraocular hemorrhage has been reported as following the operation upon any human subject. Paralytic effects are ptosis, some enophthalmus, ocular and nasal injection and hypersecretion, and often increased temperature of the same side of the head. The ocular and nasal injection usually disappears quite early, and enophthalmus diminishes gradually. Ptosis may disappear, but in many cases it continued as long as the patient was under observation, though often to a less marked degree than immediately after the operation. Pain or difficulty in swallowing has been occasionally observed, but this symptom has usually disappeared early. An accidental complication, due probably to section of the recurrent laryngeal nerve, has been hoarseness amounting, at times, almost to aphonia. In one case of Mohr's there was slight motor disturbance of the right arm. The operation can, therefore, be regarded as a relatively harmless one, which, as yet (in the cases operated upon for glaucoma) has not injured either the eye or the general health of any patient. In other words, if it does no good, it can safely be said that it does no harm. If the bilateral operation is to be performed, resection should be done first on one side, and after an interval of several days or weeks it can be done on the other side. Fatal results have been reported when ablation of the ganglia on both sides has been performed at one operation, as was not infrequently done formerly, when the operation was resorted to for epilepsy, exophthalmic goiter, etc."

The benefits claimed for sympathicectomy in glaucoma are diminution in tension, improvement of vision, widening of visual fields and relief from pain. Marple points out that it is difficult to decide just what the operation has accomplished and in what forms of glaucoma, if any, it is indicated, since many of the reports have been made a short time after operation, without accurate and long-continued observations of the patients operated upon; only 20 per cent. of the cases had been under observation for a year or more. The writer gives the opinions of a number of operators on the indications and the immediate and later results of the operation. He adds two tables, the first giving the results of the operation in 13 cases

observed for one year or longer, the second in patients observed less than one year.

Based upon the reports of these 86 operations performed by various writers, and handicapped by the difficulties above alluded to, the writer sums up the present status of the procedure as follows:

"1. That the operation of extirpation of the sympathetic ganglion is a safe procedure in the hands of a skilful surgeon.

"2. That (as Ziehe says), while the material is not yet sufficient to reach a positive conclusion as to the permanence of its effect, it is nevertheless established that some of the glaucomatous cases have been improved for some months by resection; in others the condition apparently remains stationary. The results have varied, and one cannot yet be sure in what cases it can be advantageously employed. It at least, apparently, does no harm. A considerable number of favorable results have been reported in chronic irritation or inflammatory glaucoma as well as in simple glaucoma, in which oftentimes pain is abolished.

"3. It does not replace iridectomy, but may possibly supplement the latter, in case this is refused or has already resulted disastrously in the other eye, or is contraindicated, as in hemorrhagic glaucoma, dacriocystitis, etc.

"4. Until our cases are observed more carefully and for a longer period of time, it will be impossible to arrive at positive conclusions as to the indications for the operation, or as to its permanent results."

Thrombosis of the Cavernous Sinus; with Report of Four Cases, Including one Cranial Operation.

DWIGHT, EDWIN WELLS, and GERMAIN, HARRY H., Boston, Mass. (*Boston Medical and Surgical Journal*, May 1, 1902.) The writers give the histories of four cases of this rare and serious condition; there was a fatal termination in all four instances; one was operated upon, the cavernous sinus exposed, incised and drained. These cases are reported and a study of the subject is presented with the hope that surgical intervention may be more common and productive of better results.

The literature of the subject (a full bibliography being appended) includes 182 cases, of which 14 recovered. It

has been taken for granted, that on account of its anatomical position the cavernous sinus was not available for surgical intervention and with few exceptions, all authors have agreed that the only justifiable operation was that of drainage through the orbit, with or without enucleation of the eyeball. Most authorities consider the treatment entirely preventive. In those cases in which the cavernous sinus has been involved by extension from the ear through the lateral sinus, an attempt has been made to drain all the basal sinuses by opening and curetting the lateral; three cases of this sort recovered.

"The prevalent feeling against operation in these cases apparently depends upon three facts: the supposed inaccessibility of this sinus, the extreme degree of toxemia which is present in most of these cases when the question of operation arises, and upon the common opinion that thrombosis of a single sinus, or thrombosis limited to the cavernous sinuses, must be rare. In forming an opinion on this latter point, based upon the reported cases, there is great difficulty, on account of the fact that the vast majority of these cases are not reported in detail, and conclusions drawn from them may be, for that reason, faulty. We believe that it has been demonstrated by the operation of Hartley and the one reported in this paper, that the cavernous sinus is not inaccessible; that it may be reached by means of a route described without grave danger to the patient and with at least a low mortality from the operation itself. Second, as to toxemia, it is at least as unfair to say that because toxemia to a grave degree is present during the late stages of this condition no operation should be done, as it would be to claim that because a similar condition with general peritonitis was found in fatal cases of appendicitis, therefore operation in the earlier stages was contra-indicated. On the third point we are prepared to accept the statement that the figures upon which our conclusions are based are inaccurate, but allowing for a degree of inaccuracy, we are still justified in saying that in a considerable number of cases the thrombosis is limited, even at the autopsy, to one or both cavernous sinuses, and the operation reported herein shows that an incision into one of the cavernous sinuses will drain both."

Thrombosis of the sinus may be the result of a septic process, may follow injury to the head, direct injury to the sinus, or develop in the course of debilitating disease (marasmic). Infective thrombosis may occur by contiguity of tissue but this is rare. It may result from extension through the tributary veins or by extension of thrombi in the other sinuses (secondary); the former is the common origin of primary thrombosis of the cavernous sinus and usually takes place through the ophthalmic vein: the latter is the most common if we include all cases, having been present 43 of 149 cases, the disease originating in the ear and the lateral sinus being the first to become affected.

The symptoms are fairly constant, and since the process is usually an acute one, come on rapidly; local circulatory disturbance occurs early in the development of the thrombus. Septicemia or pyemia is always present to a greater or less extent and may be sufficient to mask the disease; there is cerebral irritation, constant and general headache, nausea and vomiting, chills, elevated temperature with marked remissions, and rapid pulse. The patients are always extremely sick early in the disease; at first they are nervous and apprehensive, later, dull and typhoidal. There are marked cerebral symptoms, increased reflexes and vertigo. Localized meningitis is rare. Ocular paralysis or paresis is common.

Local circulatory changes are manifested chiefly in the eye: on account of anatomical arragements, usually both cavernous sinuses are involved and in one quarter of the cases. a single cavernous sinus was involved. "If formation of the thrombus be slow, collateral circulation may be established by the means of the anastomosis between the inferior ophthalmic vein and the pterygoid plexus; when this occurs the various symptoms dependent upon passive congestion. including proptosis. will not be marked; when the onset is sudden the symptoms dependent upon passive congestion will be marked: exophthalmos with edema of the lids, conjunctivæ and face coming on early, while the frontal, supra-orbital and angular veins are dilated. Within forty-eight hours the process has usually extended to the opposite side with the same train of symptoms, while the condition of the eye

first affected usually improves. By this time the general symptoms have become very grave, and as diagnosis becomes easier, the probability of relief by surgical interference is reduced. The fundus shows dilatation and tortuosity of the retinal veins with retinal edema and, later, hemorrhage. Optic neuritis occurs early. The view of the fundus is soon obscured by haziness or ulceration of the corneæ resulting from pressure."

Diplopia is one of the early symptoms and is probably common; it is usually in all directions. The pupil is dilated and may or may not react to light and accommodation; where the exophthalmos is not very marked it usually reacts. Vision diminishes rapidly and the eye is blind within a few days. Edema of the mastoid is commonly given as one of the symptoms of thrombosis of the cavernous sinus; it is, however, as far as we are able to judge, due to thrombosis of the lateral sinus.

Regarding diagnosis the writers express themselves as follows: "Certain rare cases occur in which for one reason or another, exophthalmos is absent in cases of thrombosis or obstruction of the cavernous sinus, but these are rare cases, and when they do occur are usually of slow onset and most frequently secondary, through some other sinus, or due to inflammation within the skull. When exophthalmos is present and associated with symptoms of toxemia, the case is always a suspicious one. Under such circumstances differential diagnosis must lie between orbital celluitis and thrombosis of the cavernous sinus. It must also be remembered that a process beginning as orbital cellulitis may readily extend to the cavernous sinus. The changes in the fundus are never so marked in orbital cellulitus; obstruction to circulation is much less, and the headache is supra-orbital rather than deeply seated. Constitutional symptoms are much less severe in orbital cellulitis, and if the symptoms extend to the other eye the diagnosis of thrombosis of the cavernous sinus is practically assured. When the source of infection exists in any of the regions which are drained into the cerebral sinuses, and when the symptoms presented are suggestive of circulatory disturbances within the skull, the possibility of sinus thrombosis should always be considered."

In conclusion the writers refer to their own cases and

that of Hartley as justifying the belief that direct opening of the cavernous sinus can be effected without grave danger to a patient in fairly good condition. "Our case shows that an incision into one sinus instantly and completely relieved the interference with circulation in both. It also demonstrated the fact that such an operation is not associated with extreme difficulty, that it can be done under almost primary anesthesia, not associated with any degree of shock, finished within a few minutes—in this case eight—and that the hemorrhage is easily controlled. These two operations would apparently justify our belief that thrombosis of the cavernous sinus is distinctly an operable condition, and that the operation described herein holds out reasonable hope that its acceptance may be followed by a decrease in the present mortality in this serious condition."

Investigations on Eye Magnets.

TURK, SIEGMUND, Berlin. (*Archives of Ophthalmology*, March, 1902.) The writer claims that our ideas of the relative utility of the Haab and the Hirschberg magnets have been based upon clinical results, that we are not altogether clear as to the power of the two instruments, and that their scope has not been accurately determined. There is no exact knowledge of the power of each of the two magnets upon the small particles of iron usually found in the eye and of the effects at various distances. In order to gain more definite information in the matter, he had made eight elongated iron splinters weighing 1, 5, 10, 20, 50, 100, 250 and 500 mg., and determined the power with which each splinter was attracted at distances of 2, 5, 10, 25, 40 and 50 mm.

"This presentation shows conclusively that the attracting power is less the smaller the splinter, but the amount of the decrease is not always commensurate with the weight of the splinter. The relation between the two is most exact when the splinter is 0.5 cm. away. If the power of attraction on the larger splinters is taken as a measure, in general at short distances the attraction for smaller splinters is greater than would correspond to their weight, and at longer distance is less." This is shown by a table which also demonstrates the fact that in direct contact with splinters from 1—250 mg. in weight, the power of the

Hirschberg magnet is but little less than that of the Haab instrument, though the difference is greater when the blunt cylindrical tip of the Haab magnet is replaced with a longer, conical tip. On the other hand, the difference in strength of the two magnets is very marked when the splinter is removed any distance from the tip; even at 2 mm. the Haab magnet is from 7—21 times as attractive for splinters weighing 1—250 mg. as is the Hirschberg.

The writer insists upon the necessity for caution in using an instrument so powerful as the Haab magnet—correct direction of the eye to be operated upon, and the use of just sufficient power to extract the foreign body. Since the relative power of the magnet increases as the splinter is drawn toward it, the last precaution presents some difficulties which may be avoided, either by bringing the eye close to the magnet and gradually increasing the power of the latter, or with full current on, by bringing the eye gradually nearer the magnet and extracting at the greatest possible distance.

The non-uniformity of the attracting power cannot be changed by diminishing the current or by using medium-sized magnets; but the farther the instrument is removed from the field of the operation, the more uniform will be the attraction of the foreign body in its entire course. Hence, the stronger the magnet, the farther it may be removed from the eye and the more uniform will be its attraction.

Regarding the kind of magnet to be used, the writer expresses the following views: "The small magnet may be used when, without injuring the vitreous, it can be brought within a few millimeters of the foreign body. When the foreign body is in the anterior or posterior chamber or in the iris or lens, this can be accomplished by making a corneal section. In the case of deeper-lying foreign bodies, the large magnet should be used. Only when the large magnet does not attract a very small or entangled foreign body, or when there is danger of lacerating the uninjured lens in extracting a large foreign body, is the introduction of the small magnet into the vitreous indicated to accomplish the extraction."

Is the Dislocation of the Lens into the Vitreous Ever Justifiable?

SUKER, GEORGE F. (*The American Jour. of Ophthalmology*, June, 1902.) The writer justifies the occasional performance of sclero- or keratonyxis in selected cases of cataract, although this operation is now considered obsolete. He considers that the operation may be justifiable in, 1, the insane; 2, the epileptic; 3, hemophilitic: 4, cases with a tremulous iris or fluid vitreous, but without chorioiditis or retinitis; 5, cases with incurable dacriocystoblenorrhea or conjunctivitis; 6, extreme old age with its attending infirmities; 7, cases with incurable bronchitis and cough; 8, cases in which one eye was lost by suppuration, and indications pointed strongly to the same fate if the other lens was extracted; 9, in shrunken and secondary cataract—i. e., secondary to some inflammatory reaction; 10, in partial posterior dislocations with tremulous iris.

He elaborates and explains the circumstances under which, in each of these cases, dislocation of the lens might be proper, and sums up the most salient points of his paper as follows:

"1. The percentage of failure in the class of cases in which a depression can be performed is no larger, on the contrary less, than in the same cases operated upon by extraction.

"2. Do not depress a lens in cases with chorioiditis or retinitis.

"3. Consider depression in all cases where one eye has been lost by an extraction, and conditions point convincingly to the same in the other eye.

"4. Depression of the lens must not be indiscriminately performed, but only in such cases where the contraindications for extraction outweigh its own objections.

"Finally the writer considers reclination of the lens as an exceptional procedure, and can only regard it as unquestionably indicated in such a class of cases as has been alluded to, when the general constitution of the patient or the previous experience with the fellow eye unhesitatingly point to a failure if the extraction method were resorted to. It should rarely be performed; for it is only in rare instances that suitable cases present themselves. In any

given case, weigh full well the pros and cons of either operation, and, if the balance is in favor of one or the other choose that one, be it a reclination or an extraction.

"As it is largely a matter of good judgment and discretion, we have no cause to find fault with anyone who exercises his prerogative as a physician and thus practices *secundum artem* though he does resort to a method at present cast into oblivion and only receiving a bare mention in the modern text-book as an historical operation."

Report of Several Cases of Corneal Complications in Conjunctivitis, Due to the Koch-Weeks Bacillus.

SHUMWAY, EDWARD A., Philadelphia, Pa. (*Philadelphia Medical Journal*, April 26, 1902.)

The writer refers to an epidemic of acute catarrhal conjunctivitis which existed in Philadelphia during the past two months, in which the cases occurred in an unusually severe form and presented peculiar features. There was marked thickening of the conjunctiva and the formation of phlyctenulæ at the corneal margin. The histories of three instances in which the secretion was examined microscopically are given. Previous to the occurrence of the present epidemic Shumway's experience had corresponded with that of other observers, who found the pneumococcus by far the most frequent cause of acute contagious conjunctivitis in Philadelphia. He adds the following conclusions:

"1. The Koch-Weeks bacillus conjunctivitis is apparently becoming more common in Philadelphia than has been hitherto observed.

"2. It may present itself in a particularly severe form and be complicated by phlyctenules and even by corneal ulceration.

"3. These cases are especially contagious, and extra precautions should be taken to prevent their spreading, particularly among the school children.

"4. As a rule, they are controlled by the use of mild astringent lotions and applications of 2 per cent. solutions of nitrate of silver. We have not tried protargol, but equally good results have been obtained by other observers when the solutions used have been of sufficient strength, viz., 10 to 20 per cent."

Observations Upon Recent Methods of Treating Corneal Ulcers, with Especial Reference to the Use of Carbolic Acid as a Not Infrequent Substitute for the Actual Cautery.

THEOBALD, SAMUEL, Baltimore, Md. (*Am. Jour. Med. Sciences*, June, 1902.) The writer speaks of the good results which have been obtained from the use of carbolic acid in the treatment of threatening ulcers of the cornea, for its germicidal effect and as a substitute for the actual cautery. He has not been in the habit of using the actual cautery for the control of corneal ulcers upon small provocation, being inclined to use, instead, some more easily managed and less dangerous procedure. He calls attention to the fact that the use of the actual cautery may be followed by permanent opacity of the lens, almost invariably leaving an indelible leucoma of the cornea, and may easily lead to an unintentional opening of the anterior chamber.

"That the application of carbolic acid to a corneal ulcer *is* a simpler and safer procedure than its cauterization by the galvano- or thermo-cautery goes without saying. But what of its efficacy? I am not prepared to assert that it will accomplish in every case what the cautery will do, or that it should wholly supplant the latter; but I believe that, in many cases in which it is usual to employ the cautery, carbolic acid may be substituted with advantage, and that in most cases it is judicious, at least, to make trial of it before resorting to thermal cauterization.

"In applying pure carbolic acid to the cornea, it is, of course, important to limit its action carefully to the affected part. To facilitate this, the eye should be anesthetized by cocain, which renders the procedure entirely painless. I have found it convenient to make the application by means of a pointed toothpick, about the tip of which a very small quantity of absorbent cotton has been wound. If much cotton is used an excess of the acid will be taken up and it will be almost impossible to prevent its spreading over healthy portions of the cornea. To the surface of the ulcer the acid should be thoroughly applied by a gentle rubbing movement, which is, in effect, a sort of curettage. When the ulcer is foul and its walls are lined by infected and necrotic material, this should be removed with a small curette before

the acid is applied. When, however, this condition is less pronounced, aided by the loosening action of the cocain, the cleaning of the ulcer may be effected satisfactorily by means of the toothpick, armed with a wisp of dry cotton. After the acid has been allowed to remain in contact with the ulcer for a few moments, the lids meantime having been held apart, its further action should be arrested by flushing the cornea with sterile water, normal salt solution or a saturated solution of boric acid. After the effect of the cocain has passed off some smarting or discomfort may be felt in the eye, but usually this is not pronounced.

"The effect of carbolic acid upon the surface of the cornea is rather startling, for it attacks the epithelium energetically and, in an instant, renders it opaque, causing it to assume a milky appearance. Bowman's membrane, it would seem, is much more capable of resisting its caustic action, for the superficial opacity which it produces quickly disappears."

The Spontaneous Cure of Senile Cataract.

STEPHENSON, SYDNEY; London, England. (*The Lancet*, April, 26., 1902.) Stephenson considers the spontaneous cure of senile cataract a rare event, in countries like England where the condition is not allowed to become hypermature. He considers the result brought about in the following ways (disappearance of lenticular opacities in diabetics being excluded):

1. The commonest is for the opaque lens to become slowly absorbed, a process that seemingly may even extend to the capsule. 2. Formation of a so-called "milky" or "Morgagnian" cataract, in which the hardened nucleus floats in a liquified cortex; in these cases the cortex may be converted into a clear, transparent fluid through which the patient may be able to distinguish external objects, especially when the nucleus lies out of the line of sight, as it would do in the upright position. 3. The cataractous lens may become dislocated in the vitreous, where it may remain for years apparently without entailing harm to the eye. 4. The lens may become dislocated into the anterior chamber and undergo gradual absorption. Numerous references to reports of cases are given, and the history of a patient in whom there was successive

dislocation of each cataractous lens into the vitreous, with recovery of excellent sight, is added.

On Intraocular Epithelial New Formations.

ALT, ADOLF, St. Louis, Mo. (*The American Journal of Ophthalmology*, April, 1902.) The writer alludes to his former descriptions of certain new formations which take their origin from the pigment epithelium of the ciliary body during a plastic cyclitis; and mentions his studies which convinced him that the pars ciliaris retinæ may also proliferate in the same manner, forming new layers or cylinders and cylindrical tubes growing toward the interior of the eye, remaining unpigmented or becoming pigmented at a very late date. These observations seem to have started the history of intraocular epithelial new formations.

The writer speaks of Treacher Collins' announcement of the glands of the ciliary body, the name given to the pegs which spring outwardly from the pigment layer of the ciliary body, especially in its smooth portion, and feels sure that the observer is mistaken as to the special glandular character of these pegs and in assuming that the cell-cylinders were pathologically enlarged glands. The writer refers to a paper in which he has shown that these pegs do not become enlarged in these cases and that they may co-exist in an unaltered condition with the cell-cylinders which grow toward the axis of the eyeball from the two retinal layers of the ciliary body. "As a direct consequence of his views, Collins calls the tumor just mentioned and formerly described by me an adenoma, which is perhaps correct, only with the understanding that Collins' so-called glands had nothing to do with its origin."

Alt reviews the various reports of intraocular epithelial new formations made by himself and by others, showing that "there can be no longer any doubt but that epithelial new formations are found to spring from the two epithelial layers of the ciliary body and processes, and in rare cases from the pigment epithelium of the chorioid."

"There is, furthermore, no reason why similar new formations might not take their origin from the epithelial covering of the posterior surface of the iris. Such an observation, and so far it seems the only one hitherto published, was made by Hirschberg and Birnbacher, who de-

scribe a case of spongy carcinoma of the posterior layer of the iris (Centrbl. f. prakt Augenhlk., 1896).

When speaking of these new formations we must, however, not forget that their malignancy is as yet not proven, as only one patient, that of Griffith, died from such a tumor. On the contrary, the character of these tumors seems to be a benign one, and most of them have really been found accidentally, a number of them in injured and otherwise pathological eyes. The similarity to benign adenomata is frequently very apparent, as the cells of the pigment epithelium, as well as those of the pars ciliaris retinæ, seem to have a special tendency when proliferating as I stated before, to form cylinders, which are solid or may be tubular in character."

A Note on the Value of the Fluorescein Test.

BENSON, ARTHUR H., Dublin. (*Ophthalmic Review*, May, 1902.) The writer gives the results of a number of practical tests with sodic and potassic fluorescein, the solutions of both exhibiting intense yellow-green fluorescence. "It is now fourteen years since Straub introduced fluorescein to ophthalmic practice as a means of recognizing epithelial defects of the cornea and conjunctiva, and two years ago W. Bihler claimed to have still further extended the diagnosticating use of fluorescein by making it available for the detection of incipient disease of the corneal endothelium at a stage when no evidence of sympathetic inflammation could be detected by any other means. He used, I believe, a 5 per cent. solution, after instilling cocain."

Benson comments upon the incomplete references to the action and diagnostic value of this test in modern textbooks, giving quotations, and adds: "In all these, with the single exception of the foot-note by Fick, no mention is made of the possibility of taking up the stain except an ulcerated or abraded cornea. The textbooks all seem unanimous in stating that fluorescein will stain all ulcers and epithelial abrasions, and that it will stain nothing else, whilst in practice I have found that it would *not* stain a great many conditions that are commonly called ulcers, but, on the contrary, would stain many corneas where there were neither ulcers, epithelial abrasions, nor any pathological condition of the epithelium discoverable

by the eye, even when aided by a strong magnifying glass."

The writer has found that other ulcers besides infective ones will stain with fluorescein. Corneal epithelial abrasions and ulcerations in an active state will become stained; in some very sloughy corneal ulcers the stain is not green but yellow. In many cases the stain will affect the corneal epithelium for a considerable distance round the ulcers, where simple inspection with oblique illumination and a magnifying glass had failed to detect any corneal defect.

At times localised patches of the cornea will stain bright green, when the whole corneal epithelium seems absolutely normal in polish and transparency and this condition is not necessarily the forerunner of ulceration.

Epithelium of the cornea damaged by caustic alkalies, acids, or direct heat will stain beautifully, though the epithelium has not been abraded. The eyes of dead animals stain easily, even though no corneal abrasion exists.

"Normal corneæ of eyes which have had a good deal of cocain or holocain instilled into them will stain all over in an unevenly mottled, dotted, and streaky kind of way." This is explained by the softening effect of cocain upon the corneal epithelium and also, the writer believes, diminished vitality of the epithelium.

"The damaged ocular or palpebral conjunctiva (as from caustics, etc.) will stain not green but a yellow color, while most inflamed conjunctivæ and the conjunctiva of chronic granular ophthalmia, even when scratched to the bleeding point, will not stain. Nor will the raw surface after the removal of a scab in marginal blepharitis; though the edges of the skin round an inflamed eyelash will stain yellow. On the other hand, the roughened, partially opaque, and obviously pathological epithelium of chronic glaucoma or of typical interstitial keratitis will not take on the stain. I have never succeeded in staining the cornea in typical interstitial keratitis; it never does so unless the case is complicated by the presence of some other accompanying pathological condition of the cornea; nor will the keratitis of granular ophthalmia stain."

"Many cases, too, of corneal ulcers will not stain, for instance the chronic ulcer of granular opthalmia, though very recent ones will. As regards corneal ulcers and their staining with fluorescein, I am of opinion that those ulcers which do not stain are really those which are completely covered with a healthy, though it may be a very delicate, epithelium, for of course the epithelium spreads in from the edges and covers the whole floor of the ulcer as soon as the dead débris is removed, often long after the connective tissue has had time to fill up and make good the loss of substance of the true cornea, and it is one of the prettiest sights to watch, from day to day, in a healing corneal ulcer, the way in which the area that stains with fluorescein changes it shape and size as the epithelium encroaches upon and covers the eroded parts."

Regarding the staining of the corneal endothelium as proposed by Bihler for the early detection of sympathetic invasion of the uveal tract, the writer was unable to get convincing results, partly because he had no cases in the early stages and partly because he did not succeed in staining the endothelium when he failed to use cocain, while with cocain he was uncertain whether any of the stain was really on the posterior surface of the cornea." There is great difficulty in determining the depth of a faint corneal stain, and possibly the staining which I achieved may have been on the deep surface of the cornea, but I am by no means satisfied that it was so. In any case the staining of the anterior epithelium, if diseased, will take place almost immediately on the application of the fluorescein solution, whilst the endothelium (if it stains at all) will not do so for a considerable time, as the fluorescein has to enter the anterior chamber before it can come into contact with the endothelium. That the endothelium of the cornea will stain with fluorescein I have demonstrated in enucleated eyes."

"The use of cocain does certainly increase the staining power of fluorescein, and in more than one instance an ulcer which was plainly visible took on the stain very faintly or not at all before cocain was applied, while after one drop of cocain it stained perfectly, without any staining of the surrounding epithelium. I think, therefore, that we may conclude that when a cornea stains in

whole or in part, the stained part represents either (1) an ulcer not yet covered with epithelium; or (2) an abrasion of epithelium; or (3) epithelium in a dead or diseased condition, though not necessarily in a dying state. The fact of staining is not therefore to be in all cases taken as an indication for active treatment, though such is often taught, for in many cases an ulcer which stains is nevertheless healing quite satisfactorily, and the fact of the epithelium taking on the stain is not an indication that an ulcer will certainly form."

Diphtheria of the Conjunctiva.

STEPHENSON, SIDNEY, London, England. (*British Medical Journal*, March 22, 1902; Report of March meeting of the Ophth. Soc. of the United Kingdom.) "Stephenson communicated notes of 43 cases of conjunctivitis in which diphtheria bacilli were found. The cases formed 1.25 per cent. of the ophthalmic patients seen in two hospitals for children. The average age was 26.7 months, but 88 per cent. occurred in children under 4 years. The cases chiefly occurred during the first four months of the year and often there was a history of exposure to diphtherial infection; 40 per cent. of the children were bodily ill although the series included but three examples of really severe diphtheria of the conjunctiva. In five cases there was albuminuria, while in two cases the knee-jerks were absent. Diphtheria of the fauces or nose preceded the conjunctival affection once, was associated with it twice, and followed it once. Diphtheria of the skin was present in 7 of the children. The preauricular and other glands were generally enlarged. The malady was unilateral in about three-quarters of the cases. Death occurred once. The infection was 'pure' in 13.93 per cent. and 'mixed' in 36.04 per cent. of the cases. As regarded treatment, Mr. Stephenson advised liberal and early doses of antitoxin, with 1 in 5.000 solution of corrosive sublimate applied to the conjunctiva by means of a small spray. He concluded that 'croupous' and 'diphtherial' conjunctivitis were clinically and bacteriologically one and the same disorder."

Membranous Conjunctivitis.

JESSOP, W. H. H., London, England. (*British Medical Journal*, March 22, 1902. Report of March meeting of the

Ophthalmological Society of the United Kingdom.) Jessop read notes of 13 cases of membranous conjunctivitis. "All had adherent membrane, which left a raw surface when stripped off. Eight had Klebs-Loeffler bacillus, giving the characteristic reactions. From a culture of three of the cases guinea-pigs were inoculated, causing death in forty-eight hours, and showing necrosis of tissue at the seat of inoculation and inflamed suprarenals. There was also enlargement of the neighboring lymphatic glands. The temperature was over 100°; albumen was present in the urine, but only one case had membrane in the fauces. In no case was there paralysis or paresis of the soft palate nor absence of knee-jerk. The other five cases were tested several times for the Klebs-Loeffler bacillus, but without success. Two had streptococcus pyogenes, two had staphylococcus albus, and one staphylococcus aureus; none had albuminuria, only two had raised temperature, two had enlarged glands, but none had membrane of the fauces. The diagnosis between diphtherial and non-diphtherial membranous conjunctivitis could only be made bacteriologically. In these cases the clinical evidence of albuminuria, raised temperature, enlarged glands and signs of general diphtheria was a great aid in diagnosis. It was thus proved that all cases of membranous conjunctivitis were not diphtherial and that the type of severe diphtherial conjunctivitis mentioned in text-books was rarely seen. The term 'membranous conjunctivitis,' which was convenient, must be enlarged to include cases due to diphtheria and other organisms."

Remarks on Myasthenia and Ophthalmoplegia.

GOWERS. WILLIAM R. (*The British Medical Journal*, May 24, 1902.) Gowers gives the histories of three cases of this mysterious disease, in which the eye symptoms were pronounced. He defines this malady, commonly called "myasthenia" or "myasthenia gravis," as a rare disease, "the character of which has only been discerned during recent years. It is met with chiefly in the first half of adult life, and is characterized by general feebleness of the muscles, and also by their quick exhaustion on use and the quick renewal, by rest, of what power they possess." The same features are often present after electrical stimulation. "This weakness is not attended by definite

wasting or loss of electrical excitability. Although general, it is especially marked in the lips, palate, pharynx and, often, in the muscles of mastication, and in those of the eyeball. The 'bulbar' weakness, indeed, first attracted notice, and the condition has hence been termed, also, 'myasthenia bulbaris.'

"The course of the disease presents curious variations, but it is seldom definitely progressive, nor has great improvement been often seen, except as a transient event. Death has been the result of intercurrent diseases, and has yielded no clear indication of the nature nor even the seat of the malady. In the absence of fact, theories have abounded. Treatment has seldom had marked effect.

"The symptoms vary in different cases, and in some there has been considerable loss of power in the eye muscles. The object of this paper is to describe three cases in which this feature was very marked, and also to call attention to another symptom which each presented—a peculiar alteration in the smile, due to the absence of the normal action of the zygomatic and risorius muscles."

Describing the ophthalmoplegia, the writer says: "Loss of power in the eyeball muscles has been mentioned as among the symptoms of many cases of myasthenia, but unfortunately has never been carefully described. In these three cases it was a most conspicuous and enduring symptom. It presents, at first sight, a strong resemblance to the ophthalmoplegia from nuclear degeneration. Yet there are some noteworthy differences, possibly of much significance. One of these is the greater escape of the muscles moving the eyes downward, and the implication in various degree of those moving the eyeballs upward. Not less striking is the constant and irregular affection of the lateral muscles, and that in some muscles it presented extraordinary variations at different periods.

"In all cases the light-reflex of the iris was perfect, and I believe that this has been the case in all recorded cases. The condition of accommodation was not easy to ascertain, on account of the presence of hypermetropia, but in two it seemed impaired, and the action of the pupil on accommodation seemed impaired with it, but the hindrance to convergence made the observations on this point uncertain.

"Ptosis was a marked feature, as in most cases, but there was no correspondence between its degree and the impairment of the upward movement of the eyes. Equally common was the weakness of the orbicularis palpebrarum, which was so marked in the second and third cases, while in the second case the weakness of the frontales was also conspicuous."

Amaurosis (Atrophy of the Optic Nerve) and its Treatment by the Subcutaneous Injection of Strychnia.

DERBY, HASKET, Boston, Mass. (*Boston Medical and Surgical Journal*, May 15, 1902.) The writer calls attention to the frequency of occurrence of optic nerve atrophy and of the continued unsatisfactory results of therapeutics. Referring to notes of 117 cases occurring in his own practice, he found that 78 were males (average age 44), 38 were females (average age 38); both eyes were affected in 86 cases, one only in 31 cases. In 71 cases there was no history to be traced. In the remaining 46 the probable causes were abuse of alcohol and tobacco 11, syphilis 8, blow on head 9, brain disease 6, apoplexy 1, epilepsy 1, tabes 1, meningitis 2, optic neuritis 2, erysipelas 2, mumps 2, following pregnancy 1, tumor of pituitary body 1.

Coming to the question of therapeutics, he takes exception to the generally accepted opinion of the futility of treatment. He was able to subject 26 patients to the effects of strychnia applied in gradually increasing doses by subcutaneous injection in the temples; of these patients, in 15 the disease progressed and blindness followed, in 1 there was doubtful relief, in 8 appreciable relief. By relief he means an evident cessation of onward march of the disease with occasionally a slight increase in limits of field and acuteness of vision; in each instance, the patient was held under observation for a sufficient length of time.

Derby gives the history of the use of strychnia in amblyopia and amaurosis, showing that many years ago this remedy was much more highly thought of than in recent years. He adds brief histories of the 8 cases in which favorable results followed.

"As regards the technique of these injections I would say that I have been accustomed to make them in either

temple alternately. Since using aseptic precautions I have never observed any local irritation. Previous to this abscesses were not uncommon. I begin with .04 of a gr. and add .01 daily. until constitutional effects are observed, expecting generally to reach at least the tenth injection. By that time the temples are apt to be a little sensitive, so I wait ten days and then repeat the course. In some few cases a third course of injections has been found of advantage.

To sum up the whole matter, I freely admit that these cases are not brilliant as to result. But the malady is in itself so fatal, and has been regarded as so hopeless, that it seems to me the smallest chance of relief, whether temporary or permanent, ought not to be allowed to slip. The following conclusions are justifiable:

(1) Strychnia is a stimulant to the optic nerve. Even in normal eyes it slightly increase the acuteness of vision and widens the visual field. These effects are temporary. (Fuchs).

(2) In certain cases of optic nerve atrophy its local subcutaneous injection has. to say the least, coincided with an arrest in the progress of the disease, and has been followed by a somewhat increased acuteness of vision. Whether these effects are temporary or permanent, time and fuller statistics will show.

(3) In a progressive case of this disease it is clearly our duty to state the above facts to the patient, and allow him to take the treatment if he is so inclined.

(4) The strychnia should always be administered in the temple, and by subcutaneous injection."

The Cycloplegic and Mydriatic Actions of Atroscine and l-Scopolamine.

MACKLIN, WALTER F., New York. (*Archives of Ophthalmology*, March, 1902.) The writer has compared the actions of these two cycloplegics and finds them identical. Atroscine is defined as a pure crystalline base, existing in commercial scopolamine, in what was originally termed hyoscine.

"There is little or no difference in the action of atroscine and l-scopolamine, which fact supports the statement of Dr. Hesse, that they are identical in nature. When used in one per cent. solution (perferably in castor oil), they

act as rapid and powerful mydriatics, and, as cycloplegics, are as potent and reliable as atropine sulphate, while the power of accommodation returns in five days. Of course, with homatropine this power returns in twenty-four hours, which is undoubtedly a great advantage in many cases, yet homatropine has disadvantages which must be apparent to all who use it, notably the fact that it never does completely overcome accommodation, but leaves it in an uncertain and indefinite condition of unstable equilibrium—at one moment giving one result and later quite a different one—always leaving an element of doubt as to whether a correct conclusion has been arrived at or not. Such doubt never exists after the use of atroscine or iscopolamine."

The writer believes it an advantage to use mydriatics in oily solution. "To apply, dip a glass rod into the oily solution, allow the surplus to drain off, and then lightly touch the conjunctiva of the lower lid. In this way but little oil is used and no difficulty will be experienced in making the subsequent retinoscopy. The advantages of the oily solution are: 1. Only one application is required. 2. More rapid and certain action of the drug."

Tables are presented which embody the results of the action of scopolamine and atroscine in cases. These show that: 1. Mydriasis begins in ten minutes and is complete in twenty. 2. Cycloplegia begins in ten minutes and is complete in about fifty (average). 3. The power of accommodation returns to normal in five days (with occasional slight variations). These drugs have never failed to give me satisfactory results, and I believe that they ought *always* to be used in preference to homatropine in school children and all other persons with active accommodation, who can possibly afford the necessary five days' time."

The Value of Trikresol as an Antiseptic in Ophthalmic Practice.

Jackson, Edward, Denver, Colorado. (*The Ophthalmic Review*, June, 1902.) The writer considers trikresol solution (1 to 1,000) to be more nearly an ideal basis for collyria and as an antiseptic solution adapted to the eye than any other solution yet tried in ophthalmic practice. This agent was first recommended by E. A. de

Schweinitz, of Washington, in 1894. After two years' use, Jackson finds its bacteriological influence to be all that was claimed. Instilled into the conjunctiva, it causes a very slight, momentary sensation of burning. He has used it as a basis for solutions of cocain, eserine, most of the mydriatics, and even boric solution in some cases; but not for solutions of homatropin or atropin, when repeated instillations are required, since even the slight sensation and increased lacrymation are objectionable. He has found that a solution of 1 to 1,000 is free from the risk of making the eye worse in any respect, is an antiseptic solution that will at least keep itself clean, and that it has a distinctly germicidal influence when used to wash out the conjunctiva. "While the solution of 1 in 1,000 has a very noticeable smell of trikresol, this smell does not remain noticeable about the patient on whom it has been used. In all respects it seems superior to carbolic solutions to lay instruments in, to keep them from contamination after cleansing. It is superior to formaldehyde solutions, for this purpose, because there is no need to remove a source of irritation by rinsing the instrument coming from it in something else before using it upon the eye."

A New Substitute for Silver Nitrate.

BARNES, ALBERT C., and HILLE, HERMANN, of Philadelphia. (*Medical Record*, May 24, 1902, and *American Medicine*, May 24, 1902.) The writers describe the properties and actions of silver vitelline (a combination of silver with a proteid occurring naturally in the yolk of egg). This compound occurs as a dark-brown powder, contains thirty per cent. of silver (twice the quantity of any silver proteid heretofore produced) and has all the advantages possessed by other silver proteids: It does not precipitate albumen or silver chloride and, consequently, has no coagulating effect upon mucous membranes nor their secretions; great penetrating action, without causticity or irritation, and free solubility (an ounce being completely soluble in two drachms of water). Its penetrating action is shown by immersing a thick strand of catgut in a solution of silver vitelline for a few hours, after which, upon cutting the catgut, it is seen to be impregnated through and through with the silver.

Clinical results in the treatment of gonorrhea have been

very satisfactory. The writers predict equally brilliant results from the use of this new silver compound in purulent conjunctivitis, dacriocystitis, etc. Clinical studies in these directions are now being made by Dr. A. G. Thomson, of Philadelphia, and Dr. Gustav Hartridge, of London.

Transient Monocular Blindness.

Posey, William Campbell, Philadelphia. (*The Journal of the American Medical Association*, May 31, 1902.) The writer calls attention to the infrequent occurrence of transient monocular blindness apart from the momentary blurring of vision from a tired ciliary muscle, or the partial blindness which accompanies migraine, or the periodic dimness of sight which is so frequent a precursor of glaucoma. He gives the histories of five cases of this nature, finding it singular that such transient attacks of blindness have escaped description in the text-books.

Posey quotes from Loring and gives brief notices of the contributions of Nettleship, Priestley Smith and Wagenmann to this subject. "All of these authors attribute the loss of sight to some disturbance in the vascular supply of the eye. Indeed, in the absence of any pathological findings in the fundus, after attacks of blindness such as have been described, it is natural to impute the loss of vision to some spasmodic affection of the vessels, the spasm not being maintained long enough to cause any permanent change in the tissues.

"In all the cases the blindness, though complete for a time and recurring in several instances over many years, was transient; and the vision, after being suppressed for a varying interval, returned. It would appear from this that such attacks of blindness are not to be dreaded, that they are not deleterious to the eye and that they have no significance other than the slight annoyance which they occasion at the time the vision is affected. The prognosis, therefore, should apparently be excellent. The surgeon, however, who would not give a guarded opinion in this class of cases would commit a grievous error, for it sometimes happens that the blindness which had before been transient becomes permanent; and, as there is no way to differentiate the cases in which this unfortunate result occurs from those in which the loss in vision is only

transient, it is wiser for the surgeon not to commit himself on the final result."

The histories of two cases are given in which, after a number of transient attacks, there was a final attack as a result of which vision was permanently lost: such instances emphasize the wisdom of giving a guarded prognosis. A very interesting case of Leber's is cited, in which there were all the ophthalmoscopic signs of embolus but in which the microscope failed later to reveal any evidence of either embolism or thrombosis, the blindness and the pathologic findings being attributed to long-continued spasm pure and simple.

Since the spasm in the walls of the vessels is probably induced by endarteritis, it is of importance to prevent recurrence by treatment of this affection of the bloodvessels. Treatment and regimen suitable for arterial sclerosis should be adopted; at the time of the attack nitrite of amyl and gentle massage of the eyeball are indicated. "It has long been a recognized fact that iridectomy, by causing a dilatation of the bloodvessels, reduces intraocular pressure. This operation has accordingly been performed in a number of cases of transient monocular blindness with a view of preventing subsequent permanent blindness. Wagemann would have it performed in every case of this nature. In view of the uncertainty regarding the cause and the course of these cases, it does not seem proper to the writer to subject an eye, which may remain permanently healthy to an operation which in a certain proportion of instances, no matter how skilfully performed, renders the eye useless for visual purposes."

The Influence of Age upon the Incidence of Optic Neuritis in Cases of Intracranial Tumor.

SINGER, H. DOUGLAS, London. (*The Lancet*, June, 14., 1902). The writer has analyzed 88 cases of cerebral and cerebellar tumors in order to show the influence of age upon the incidence of optic neuritis. He concludes as follows: "Although statistics are sometimes misleading, yet a table showing the occurrence or not of papillitis at different ages, given in percentages for the convenience of comparison, shows such striking features that it is worth recording. The table does not include cases of tumor in the pons except where there was definite involvement of the

cerebellum because there would seem to be some far more important factor involved in the non-occurrence of optic neuritis when this region is the site of the disease which is at present unknown.

Age.	Number of Cases.	Optic Neuritis.				
		Well Marked.	Late or Slight.	Chronic.	Doubtful.	Absent.
Under 30 years	33	97.1	2.9	—	—	—
From 30 to 40 years	18	76.6	2.2	1.1	—	1 1
" 40 to 50 "	21	61.9	4.3	4.8	—	19 0
" 50 to 60 "	7	28.5	57.1	—	—	14.3
Over 60 years	7	—	14.3	—	28.1	57.1

"The average of the nine cases in which optic neuritis was absent was 54 years; that of 51 cases in which it was well marked was 28 years. These figures are supported by the cases which were published by Dr. S. J. Sharkey and Dr. Byron Bramwell in connection with the discussion upon the Localization of Cerebral Tumors at a meeting of the Neurological Society in 1898. The former mentions two and the latter three cases in which optic neuritis was absent, the patients' ages being 46, 50, 60, 54 and 60 years respectively, giving an average of 54 years.

The above analysis appears to justify the conclusion that absence of optic neuritis in intracranial tumor, exclusive of those occurring in the pons, is rare in cases under 40 years of age and becomes increasingly more frequent after that period of life. This result may be found to have an important bearing upon the mode of origin of optic neuritis in that it would appear *prima facie* to be in some way dependent for its existence upon the healthy condition of the vessel walls."

Chlorosis and its Relation to the Eye.

SUKER, GEORGE F., Chicago, Ill. (*Medicine*, May, 1902.) The writer alludes to the customary association of chlorosis with the female sex and the age of puberty, but adds that this condition is more frequent in the male sex than is

commonly supposed and that it is often seen later than the thirdieth year. A brief review of the pathology of chlorosis is given and concludes with the following statement: "To sum up the pathology of chlorosis we must say, in view of the statements above briefly outlined, that it is an oligochromemia dependent upon a faulty hemopoiesis, the latter turn being due to a deficient hemoglobingenesis. In other words, we can call it autotoxemia and the lesions in the fundus as the result of this toxemia."

The various symptoms and ocular conditions either directly dependent upon or aggravated by the existence of chlorosis are described in detail. The paper closes with the following conclusions:

"1. Optic atrophy, papilloretinitis, and pseudoalbuminuric spots can and do have a chlorosis as their causative factor.

"2. Double optic atrophy associated with chlorosis may simulate brain tumor to a marked degree.

"3. Headaches due to a refractive error and asthenopia are of a severer type and are often aggravated by the chlorosis.

"4. Arterial pulsation in the retina is indicative of the severity of the disease, as is also the venous pulse.

"5. The fundus lesions in chlorosis are the result of an autotoxemia.

"6. The prognosis in nearly every case is favorable, considering the severity of the hemic lesion, excepting in optic atrophy.

"7. The foci of fatty degeneration in the retina deserve special attention, so as not to be mistaken for albuminuric spots."

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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(Quarter Ending June 30, 1902.)

Kinescopy: New Method for the Determination of Ocular Refraction.

HOLT, Christiana, Sweden. (*Annales d' Oculistique*, April, 1902.) Holt describes his method of application and the instruments used in the determination of errors of refraction by the observance of the motion of fixed objects when seen through a narrow fissure in a moving disk. An object seen is given an apparent motion contrary to that of the disk if there is hypermetropia, and one which is similar to that of the disk if there is myopia. The amount of refraction-error is determined by the lens that is neccessary to render the objects seen immobile. In astigmatism, the author first estimates the angles with a Javal Schiötz ophthalmometer; and then with the kinescope, he determines the error of each meridian—commencing with that of the last error.

His instrument consists of a firmly mounted revolving disk. In its circumference there are perforations fitted with lenses of various strengths. On a cross arm situated on the posterior surface of the standard, a truncated cone with a stenopaic slit in the apex, is attached. This arm can be rotated to each side of the disk in accordance whether the right or the left eye is to be tested. As a fixation-object, the author employs a standard supporting

a black disk of thirty centimeters in diameter on one face of which a white disk of five or ten centimeters' diameter is centered: On the other face of the disk there is a revolving white linear-index whose inclination can be determined by numbers on the disk-circumference. By means of this any angle corresponding with that of the stenopaic slit can be gotten.

In his hands the method has proven efficient in determining the correction of malingerers, and in one case of secondary cataract it was the only plan that was available, the results being sustained after operative procedure.

The method is somewhat similar in principle with that of the fundus-reflex test, the amplitude and rapidity of the movements however being directly proportional with the amount of ametropia.

Ocular Complications of Meningitis.

LE PRINCE. (*Annales d'Oculistique*, March, 1902.) Le Prince reports the following case: a nineteen year old male enjoyed good health until he developed an acute outbreak of meningitis accompanied with pain in the neck and coccyx, vomiting, and right hemiplegia. Slight improvement took place, followed in a few days by a relapse, during which time a divergent squint developed on the right side. A few weeks later, complete blindness, lasting almost a month's time, appeared.

Following another acute exacerbation of pain in the head and limbs the patient rapidly improved, vision greatly bettering.

Eight years after these attacks, vision was found to be better but the visual field of the right eye had become concentrically contracted.

Thirty years after, vision with the right eye equalled four-tenths of normal, while that of the left was one-half of normal. At this time, some improvement followed the use of electricity. With the exception of a slight paleness of the disc, there were not any alterations in the fundi.

The author compares his case with that reported by Teillais, and believes them both to have been the result of basilar meningitis; especially so, on account of the involvement of the oculo-motor nerves. The favorable result teaches us, he says, not to be too pessimistic in re-

gard to the prognosis of the post-ocular complications of meningitis.

Differentiation of Granular Conjunctivitis from Acute Infectious Conjunctivitis.

MORAX, Paris. (*Annales d'Oculistique*, March, 1902.) The symptomatology of trachoma, Morax says, is still undecided, as the result of the teachings of the anatomical school and of the frequent superposition of an acute infection whose symptoms are attributed to the original condition.

The morbid changes accompanying typical trachoma may be, he says, simulated both macroscopically and microscopically, by other forms of conjunctival infection; moreover, the contagious element of the disease may be as great in a case with but slight thickening of the tarsal conjunctiva as it is in a typical one. We must, therefore, he states, recognize the variability of effects from a single microbic cause and not depend too specifically on the anatomical findings. We should also consider the transmissibility and chronicity of the process. Follicular conjunctivitis, he believes, is not infrequently differentiated from trachoma by a study of its evolution alone. Tubercular and syphilitic conjunctivitides also may closely resemble trachoma anatomically. In such cases, the diagnosis can be made only from other data.

Bacteriologic researches have revealed that many of the acute exacerbations occuring in trachoma are really the result of mixed infections. In Egypt, where ninety per cent. of the indigent population is infected by trachoma, the acute outbreaks occurring during the months of April and May are the results usually of infection by the Weeks' bacillus. During July and August, the gonococcus plays a more important role, but the Weeks' bacillus persists. During these out-breaks of acute infectious conjunctivitis, the trachoma is also easily transmitted, and to it, therefore, have been ascribed the many acute symptoms that are included under the heading of "acute trachoma".

The Operation for Secondary Cataract.

PFLUEGER, Berne. (*La Clinique Ophtalmologique*, 25th May, 1902.) Pflüger enumerates the following risks of the operation for secondary cataract: 1st, primary in-

fection of the wound; 2nd, secondary infection alone, the vitreous thread reaching to the cornea: 3rd, inflammatory reaction from operative manipulation; 4th, pathologic reaction of the vitreous humor producing fibrillary degeneration with retinal detachment or the formation of opacities in the anterior portion of the vitreous.

After a brief mention of the various forms of secondary cataract and the different operative methods that are employed, the author concludes that in all operations for secondary cataract it is necessary to avoid as much as possible the loss of aqueous humor and thus more surely prevent the incarceration and loss of vitreous humor. To accomplish this purpose, the various operative instruments should be introduced through the sclera and not through the cornea or even through the limbus. The operation of de Wecker with a scissor-forceps is the best method for thick and strongly adherent secondary cataracts, the scope of the operation being open to wide use if suitable instruments are devised to prevent the loss of aqueous humor. In all procedures a double bladed harpoon is efficient, particularly when loss of aqueous humor seems inevitable.

Tattooing, a Substitute for Ocular Prothesis.

De Wecker, Paris. (*La Clinique Ophtalmologique*, 25th May, 1902.) De Wecker strongly disfavors promiscuous enucleation, and believes it absolutely indicated only in cases of malignant tumors and in incipient or developed sympathetic ophthalmitis. To avoid the practical and moral disadvantages accompanying the use of artificial eyes, he has resorted to tattooing of the globe. The operation is more difficult than on the skin of the arm or trunk on account of the mobility of the conjunctiva and the frequent presence of cicatricial elements. To assist in restoring the size of the globe and of advancing its position, he divides the recti muscles which retract and constrict the eyeball.

He details three cases in which the results were so good as to lead patients' friends to the belief that the eye had been restored to normal. He believes that the method would be more greatly employed if a better technique were used by its critics.

The Orbital and Ocular Complications of the Sinusites.

Lapersonne; Paris. (*La Clinique Ophtalmologique*, 10th

May, 1902.) Aside from a few cases of marked mechanical disturbance, the oculo-orbital complication of sinusitis, Lapersonne says, are due to infection and occur sooner or later in twenty per cent. of the cases. The orbital complications consist of first abscess in acute sinusitis; second, abscess followed by fistula in chronic empyema (this is most frequent, and especially follows frontal disease); third, abscess with necrosing osteitis of the walls of the orbit, this being the most frequent in disease of the maxillary sinus. When the condition involves the other sinuses, it is often accompanied with cerebral complications); and fourth, mucocele of chronic type, which is often bilateral and produces an exophthalmus down and out.

The lesions of the ocular adnexa consist principally of those of the lacrimal passages which accompany disease of the maxillary sinus. Distension of the frontal sinus may produce diplopia as its only symptom.

The ocular complications consist of first, corneal suppuration following dacriocystitis, which is rare; second, uveal inflammation, especially a maxillary sinusitis; third, optic neuritis or hyperemia of the nerve-head (occurring especially in sphenoidal sinusitis), thrombosis of the central vein, retrobulbar neuritis, and optic atrophy; and fourth, functional complications such as accommodative asthenopia, reduction of central acuity of vision, and contraction of the visual field.

He has found that in cases of suppurative complication, the infection passed through necrosed bone or through the Haversian systems. In nonsuppurative complications, involving the internal portions of the eye, the modus operandi is less clear, though the author believes that such conditions are best explained by direct transmission of the infection. He enumerates the usual complications that attend inflammation of each sinus, and concludes with the observation that rarely is one sinus alone involved.

A Report Upon Blindness and the Blind in France.

TROUSSEAU, Paris, and TRUC, Montpelier. (*La Clinique Ophtalmologique*, 10th May, 1902.) Trousseau and Truc admit as blind those who have not enough vision to allow them to work and obtain a living. The authors find that blindness has increased in France, but believe that this

is due to the more exact methods of obtaining data. The increase, they say, has been entirely among the adults. Geographical location has little to do with the number of cases, this depending more on their complex social surroundings.

The various causes are enumerated: Optic atrophy, glaucoma, and myopia, they state, retain their former percentage, while purulent conjunctivitis is less frequently a cause. Among the infants of the Paris schools, purulent inflammation of the conjunctiva is still the most frequent cause; this they think is so because prophylaxis is less perfect there than it is in the Provinces. Among the adults, optic atrophy is the most frequent, and among the old—glaucoma.

They have found that at least thirty-five per cent. of blindness is due to avoidable causes, and especially is this true of the purulent forms of inflammation whose prevalence is largely the result of the employment of midwives.

The second part of the article on "The Blind in France" is by Truc, and consists of remarks on the education, general assistance, and ocular aids to this class of unfortunates.

The Analgesic Value of Temporal Injections of Dionine.

TERSON, Paris. (*La Clinique Ophtalmologique*, 10th May, 1902.) Terson has employed temporal injections of dionine in the treatment of painful ocular affections, and generally with marked relief. He makes use of one-half to one per cent. strength solutions, usually finding that a centiagram dose is sufficient.

He has found that the analgesic action is more lasting than that of morphine, and that it is not accompanied with the unpleasant complications of the latter drug.

Unilateral Exophthalmus in Basedow's Disease.

GUILBERT, Roche-sur-Yau. (*La Clinique Ophtalmologique*, 10th May, 1902.) Guilbert reports the following case: A fifty-six year old female presented herself with marked exophthalmus of the left eye. The Stellwag and von Graefe signs were distinct. There was not any diplopia and the eyegrounds were normal. No orbital involvement could be discovered. There was a moderate goitre, but there was not any tachycardia.

The patient was very emotional, felt hot and cold waves pass over her, laughed or cried at nothing, had yawning crises, and showed a distinct hysterogenous zone at the level of the breast. Under the use of potassium bromide she recovered.

On the Seeing of Color Signals and the Tests of Color Perception.

BROCA. (*Annales d'Oculistique*, April, 1902.) Broca has demonstrated by mathematical formulæ that a projecter comports itself exactly the same as a luminous point, a view that is contrary to the one which is generally held that a projectory throws only a parallel beam of light.

Enucleation in Infants; Its Disadvantages. (A Substituionary Procedure.)

DIANOUS, Nantes. (*Annales d'Oculistique*, March, 1902.) Enucleation, especially in infants, gives rise, Dianous says, to a deplorable deformity and often to unfortunate moral results. It should, therefore, be done only as a last resort, as for example, when demanded by malignant tumors. The method of Gersung and the injection of vaseline (or as practiced by others, of paraffin) materially aid us in remedying such defects. In hydrops, more especially, the author has employed the following method: The cornea is slowly cauterized in lines radiating from its center to the depth of two-thirds its thickness. A cone with a radius of two millimeters is then formed in its center, the apex of which is perforated, allowing the aqueous humor to escape. A bismuth compress and bandage dressing are applied and retained for a period of three days, after which cleansing and bi-daily instillitions of cocain-eserine solutions followed by the application of compress-bandages are practiced for several weeks' time. If an excess of tension is observed, massage is employed twice daily. If necessary, the operation may be repeated. Finally, tattooing of the globe may produce surprisingly good results from an artistic standpoint.

Bilateral Lymphoid Infiltration of the Conjunctival Culs-de-Sac.

VALUDE and MORAX, Paris. (*Annales d'Oculistique*, March, 1902.) Valude and Morax report the following case. A fifty-six year old male, who always enjoyed good

health, complained only of disfigurement from swelling of the eyelids. Examination showed the lids to be thickened by neoplastic bodies which, on everting the lids, were found to be almost wholly situated in the culs-de-sac. They projected as soft, smooth, gelatinous masses in the mucus membrane. Covering these, there were a few small vessels. There were not any other lesions.

A small piece was excised and examined, both bacteriologically and microscopically. No bacteria were found, and inoculation experiments were negative, thus excluding microbic infection, especially tuberculosis. The sections showed an hypertrophied, but otherwise normal mucus membrane overlaying a collection of small, round cells that were distinctly lymphoid in character. The benign progress of the growth and the absence of all glandular involvement, probably, he thinks, excluded sarcoma.

Lymphomas of the conjunctiva, he believes, are, as a rule, accompanied with glandular involvement.

The Treatment of Pannus by Pericorneal and Supracorneal Electrolysis.

Lor, Brussels. (*Annales d'Oculistique*, March. 1902.) Lor says that two classes of this type of cases present themselves to the physician. One in which the pannus is accompanied with a fully-developed conjunctival trachoma, and a second, in which it is the only lesion—the conjunctival process having passed into the cicatricial stage. In the first class the conjunctival and corneal affections can be treated at the same sitting. The patient being anesthetized, the conjunctival granulations are destroyed by unipolar electrolysis. The cornea is treated as follows: The positive pole being applied to the corresponding cheek, a two to three milliampere current is applied, by means of a de Wecker electrolysis brush, to the whole length of the corneal limbus. By this means, the pericorneal structures are destroyed down to the episclera in a zone of three to four millimeters in width. The brush is then lightly applied over the whole cornea some two or three times until the vessels in the superficial corneal layers are reached. After irrigation and the introduction of a little vaseline between the lids, a simple dressing is applied. The after-results of the operation are undisturbing, the patient being able to open his eyelids on the

following day. If the palpebral conjunctiva has been treated, this should be rubbed with a tampon of cotton moistened in a one to four-thousand strength solution of bichloride of mercury at the end of a few days.

The author prefers electrolysis to jequirity in such cases, as he has found it more certain, more easily graduated, and better controlled on its application.

Clinical Study of the Conjunctival Lesions of Multiform Erythema.

CHAILLOUS, Paris. (*Annales d' Oculistique*, March, 1902.) The first thesis on the above subject, Chaillous says, was written in 1894, by Bernard Beaudonnet. The writer, in the present paper, reviews all of the cases that have been reported since that time, including one of his own. As a result, he makes the following observations:

The simplest form of conjunctival symptoms of multiform erythema consists in the appearance of congestion, mucoid discharge, injection of the lid margins, and agglutination of the cilia, accompanied at times with palpebral edema.

More frequently, he says, true papules of a rosaceous color are seen on the conjunctiva. These appear about the fourth or sixth day of the eruption, which they rarely precede.

In a case seen by Bruault, the papules occupied the internal and the external angles of the bulbar conjunctiva, resembling pterygia. In other cases they have appeared like a patch of episcleritis, from which they differ, however, in the ease with which they glide over the globe.

Their color is a violaceous red. Rarely, they may be paler in tint, and stand prominently forward on the injected conjunctiva. These opalescent papules are sometimes surmounted by whitish vesicles, which break down into ulcers.

In from four to ten days' time the lesions, together with the subjective symptoms, disappear.

A third and more severe class has been described by Hauke. In this type a false membrane forms on the tarsal conjunctiva. This is often accompanied with a like formation on the buccopharyngeal mucous membrane. In this type, microscopic examination revealed the presence of

numerous cocci in chains, with a few bacilli that stained by the Gram method.

Some Remarks upon True and False Intraocular Tumors. A Case of Melanosarcoma of the Ciliary Body: A Case of Circumscribed Tuberculosis of the Chorioid and Sclerotic.

ROGMAN, Gand. (*Annales d'Oculistique*, March, 1902.) The first case was that of a forty-nine year old female. Two weeks previous to admission to the hospital a small tumor on the eye was noticed. There was an absence of all other symptoms. Examination showed a pink-colored roundish tumor the size of a large mustard grain situated at the upper inner limbus of the cornea. At a corresponding point the anterior chamber was shallowed by a spheroid-like advancement of the iris tissue. The iris was normal in color and its reactions were prompt except at a point opposite the growth. The media were clear and the fundus, except for a bulging retinal detachment of the tumor site, was healthy. There were not any inflammatory symptoms. Vision was reduced to one-tenth. Intraocular tension was normal.

Sarcoma of the ciliary body with penetration of the outer coats of the eyeball was diagnosed. Enucleation was performed.

After hardening in Fleming's solution, pyroligenous acid, and alcohol, and imbedding in celloidin, the eye was hemisectioned. Macroscopically, a tumor eight millimeters thick and reaching from the ora serrata almost to the pupillary margin, was revealed. The crystalline lens was slightly displaced and its apposing margin was destroyed. Except for a detachment of the inner coats of the eyeball, the organ otherwise appeared normal.

There was no apparent connection between the inner and the outer tunics. Microscopically, the intraocular growth showed the structures of hemangio-sarcoma, cavernous sarcoma, and alveolar sarcoma, in its different parts, while scattered throughout it there were a few pigment granules.

The extrabulbar portion of the growth was pedicled, and covered by normal conjunctiva. Its structure proved to be that of an alveolar sarcoma. The sclerotic between these tumor-masses was well conserved, neoplastic cells being found only in the normal vascular channels.

In this case the absence of glaucomic symptoms and the appearance of the extraocular growth, without evident perforation, are the unusual symptoms.

The second case was in an eight year child. There was a history of chronic diarrhea, bronchitis, and numerous cold abscesses with fistular formations. During the year just before being seen, the left eye had slowly become blind. Examination showed a small rounded tumor-mass on the lower inner part of the globe, seven millimeters back of the limbus. Over this the conjunctiva was adherent and slightly eroded. The anterior portion of the eye was normal except for the absence of iris action. The media were clear and the retina was completely detatched. Intraocular tension equalled minus two. Enucleation was performed.

After hardening and hemisection, macroscopic examination revealed a tumor of the sclera and chorioid reaching from the optic nerve to the ciliary body, it having a maximum width of one centimeter. Microscopic study showed a large infiltration of leucocytes with scattered foci of epithelial and giant cells surrounding a center of necrosis.

The adjacent parts did not exhibit any gross change. The general condition being taken into account, a diagnosis of tuberculosis was made. Eighteen months after operation, there was not any local or general return of the process.

Serpiginous Ulcers of the Cornea.

Baudry, Liége. (*Le Nord Medical*, 15th April, and 1st May, 1902.) Serpiginous ulcers of the cornea, Baudry says, are also known as hypopyon keratitis. They arise often from insignificant wounds as from abrasions by the finger-nail, coarse linen, etc. They occur especially among workmen, such as stone-cutters, etc., whose eyes are constantly exposed to chips of flying dèbris. Occasionally, the infection arises from the abnormal secretions of neighboring parts. They may also occur from the acute infectious diseases, like variola and from systemic depression.

He says that Bassc claims that the pneumococcus is the only pathogenic microbe, and that Uhthoff and Axenfeld, in thirty-four cases, found the pneumococcus in pure culture twenty-five times, and associated with the staphylococcus

in eight instances. The author enumerates the symptoms, and states that while the hypopyon generally arises from the infiltrated cornea, a true endoinfection and iridociliary origin is possible. He believes that a bacteriological examination should always be made, but the findings should not be considered as an infallible guide for treatment.

The patient must be warned of the many possible complications, of which the most important are panophthalmitis, luxation and expulsion of the crystalline lens, intraocular hemorrhage, and later, adherent leucoma and corneal staphyloma. Treatment must be energetic and made with the main object for the destruction of the primary forms of infection.

In recent cases with moderate inflammatory symptoms and severe hypopyon, the eye and surrounding parts, he says, should be thoroughly cleansed. The complications should be treated and the ulcers touched with a saturated solution of methyl blue or violet, or with tincture of iodin. Frequent irrigation with weak silver or bichloride of mercury solutions may be tried. In order to reach the deeper parts, subconjunctival injections of cyanide of mercury may be given.

Atropine should be instilled four or five times a day, and a light dressing of sterile gauze should be applied. Hot douches and compresses are often serviceable. For pain, phenacetin or sulphonal may be given. The general condition must be improved by the use of tonics, purgatives, etc.

In advanced cases with large hypopyon and increased tension, curetting of the ulcer and burning with the galvano-cautery or with a heated strabismus hook should be done under cocain. If no improvement follows in a few days' time, paracentesis with a de Wecker stop needle should be made in the hypopyon area at the limbus, and the aqueous and pus evacuated by means of a spatula or a Daviel spoon. The anterior chamber should then be irrigated with sterile boric acid solution. If a deposit still remains, it may be removed by forceps. A von Graefe knife may be used for paracentesis, and if iris prolapse occurs, an iridectomy may be performed.

Finally, a Saemisch section may be done and the cham-

ber emptied as in paracentesis. He believes that atropine or eserine is to be instilled in accordance whether the ulcer is centrally or peripherally situated.

Artificial Illumination.

HOUDART, Brest. (*Recueil d'Ophtalmologie*, April, 1902.) Houdart enumerates the more important means of artificial illumination. He says that our standards of judgment must always be based upon solar illumination with consideration of its intensity, fixity, regularity, and composition. For certain purposes, as for example, school use, a standard can be obtained, but oftentimes, it becomes a matter of taste, depending on the individual and the occupation. The author believes that we are constantly warned against using too strong a light, but until a means of illumination that is more powerful than the sun is obtained, such protestations may be disregarded. He thinks that the primary necessity, together with intensity, is the avoidance as much as possible of shadows; a result that is partly obtained by using ground globes that multiply the number of luminous points.

He tells us that in 1881 the Jasper lamp was first shown to the scientific world. It consisted of a small electric light with a reflector placed beneath, which protected the direct glare and reflected the light to the ceiling, from which situation the light was reflected to the whitened walls. A large number of these lamps produced a soft uniform clear light, but its expense prevented its widespread use. He has found that in open places the shadows are less troublesome and the use of an upper reflector is sufficient. In France, the means of illumination has not improved in the schools and rural colleges since 1881; with a resultant lowering of the standard of visual acuity that is required by military schools and the army.

At present, the electric light alone unites the qualities of regularity, intensity, and conservation of normal colors, with an absence of atmospheric contamination.

As with other lights, the eyes must be protected from the direct rays, and as far as possible, the object of application should be alone illuminated. The arc light lacks fixity and is not appliable when prolonged gaze is required; it is well adopted for use in public halls, etc. Electric illumination would be the best if it were not for

the expensiveness of the fixtures. Gas jets have markedly improved, but the atmospheric contamination can never be obviated.

Acetylene gives a bright white light and would be better even than electricity for factory use if it were not for the danger connected with its employment.

Petroleum is preferable to lard oil because it offers a whiter flame and omits one-third less noxious products.

Regarding Mercurial Injections, Especially Those of Benzoate of Mercury, in the Treatment of Specific Ocular Affections.

ARMAIGNAC, Bordeaux. (*Recueil d'Ophtalmologie*, March, 1902.) Armaignac has used the various mercurial salts in the form of hypodermatic injections, but, with the exception of the benzoate, he has found the local reaction so severe as to often contraindicate their employment. For two and a half years past he has employed the benzoate, the injection of which is neither painful nor followed by disagreeable symptoms. In specific cases the results have equaled those that have been obtained by the use of the other salts. Of their use in non-specific cases he is still non-committal. The following cases are reported: The first was that of paralysis of the left inferior rectus muscle, with rapid relief from the use of iodide of potassium. Three years later intense injection of the bulbar conjunctiva and iridocyclitis, with photophobia on the same side, appeared. All medication seemed unsuccessful. Cure followed after a few subconjunctival injections of benzoate of mercury. The second case was that of gumma of the iris, in which there was a rapid cure from the subcutaneous use of benzoate of mercury. The third case was one of papillitis, probably of syphilitic origin, which was followed by distinct atrophic changes in the optic nerves, with considerable loss of vision. Improvement of sight soon followed the use of injections of benzoate of mercury.

The salt is employed in the following solution: Benzoate of mercury, one gram; benzoate of ammonia, three grams, with one hundred grams of distilled, sterilized water.

Some Alterations of the Fovea Centralis in Myopia.

GALEZOWSKI, Paris. (*Recueil d'Ophtalmologie*, March, 1902.) Galezowski tells us that, in certain ocular affec-

tions, special regions are affected even before the ophthalmoscope reveals their existence. Most prominent among these, he has found, are the changes in the macular chorioid in myopia.

These consist in minute points of exudation and atrophy which, on account of the central corneal reflex, are particularly difficult to see. To obviate this, the author has employed a three-degree strength prism, and has thus discovered macular changes in cases that otherwise only show the visual signs of asthenopia.

He finds that the macular changes bear no relation to the amount of myopia, and reports a case in which there was hypermetropic astigmatism in the left eye and low myopia with macular changes in the right. Lenses were prescribed and treatment for an existing arthritis, which was the supposed cause of the macular changes, was given.

The chorioidal changes in the macula, he thinks, have a complex significance, and arise, in part, from distension and rupture of the vessels from stretching of the ocular coats, giving rise to hemorrhages and fibrinoplastic exudation.

These lesions, he believes, acquire a doubled significance from the ease with which the neighboring coats of the retina are involved.

A derivative treatment combined with a collyrium which will produce vascular contraction is most important. Of these types of therapeutic agents, adrenalin and hamamelis are the best. The latter is employed in a five per cent. aqueous solution, which is instilled twice daily. Hot and cold compresses applied to the closed lids morning and evening, for an hour at a time, with the administration of mercurials and iodides, are also helpful.

Technique of the Injection of Solid Paraffin.

BROEKAERT. (*La Clinique Ophtalmologique*, 25th April, 1902.) After a brief review of different methods, Broekaert describes his own, which is modeled after that of Eckstein, who uses a paraffin with a melting point of sixty degrees centigrade.

The paraffin is sterilized by boiling or by exposure to dry heat for one-half of an hour. It is then kept in hermetically sealed jars. The injections are made with a

syringe of five cubic centigrammes capacity and with a piston of glass or asbestos, so as to be easily sterilized by boiling. The needle must be sufficiently large to allow a good-sized jet. When about to operate, the skin must be sterilized in the usual way. The syringe is boiled and kept in hot water, and the paraffin is melted and allowed to cool down to about sixty-five degrees centigrade. As a rule, local anesthesia is harmful, and only in infants is general narcosis necessary.

The hot syringe is filled with the paraffin and the injection is made with a moderate degree of celerity in order to avoid cooling and solidification.

A fold of skin is picked up, just as for an ordinary injection, and as soon as the injection is finished, the paraffin is properly moulded. A light dressing moistened in absolute alcohol, is applied. The after-treatment consists simply of the use of a compress. The author has never observed pulmonary embolism or subcutaneous necrosis after these forms of injection, and believes such accidents to be the result of faulty technique. Occasionally, a fugaceous edema may follow the procedure.

Monolateral Glioma of the Retina in an Infant of Four Years of Age; Enucleation of the Eye without Suture of the Stump; Union by First Intention; Presentation of Histologic Sections.

SUREAU, Paris. (*La Clinique Ophtalmologique*, 25th April, 1902.) A four year old child was brought to Sureau on the fifth of October, 1901, for the treatment of an acute conjunctival catarrh of the left eye. For several months past there had been intermittent pain in the eye, and the child had become cross and depressed. At times, the mother had noted a yellow flash from the eye. Examination showed the absence of all glandular enlargement. After subsidence of the acute catarrh the eye appeared to be normal in size and its tension was normal. The cornea was clear. The anterior chamber and the iris were normal in appearance. The pupil was moderately dilated and a weak fundus-reflex alone remained. The lens and the anterior portion of the vitreous humor were clear. To the inner side of the posterior pole of the eyeball there was a diffuse detachment of the retina, which projected well forward into the vitreous, its most prominent portion almost

touching the posterior portion of the lens. In certain positions a distinct yellow reflex could be observed.

Acute pain in the eye soon developed. The eyeball was immediately enucleated and the stump was dressed without suturing.

Macroscopic examination of the eye revealed it to be normal in size and contour. There was a complete limitation of the tumor within the ocular coats. The inner part of the retina was detached by a whitish yellow body that was here and there dotted with hemorrhagic foci.

Microscopic study revealed a thinning of the sclerotic, with absence of the chorioid at one point. The tumor, which arose from the retina, was composed of small cells containing large nuclei and but little neoplastic tissue. The cells were round or slightly elongated and, in a few places, he says, showed the formation that has been described by Fuchs. The growth was very vascular and the cells, for the most part, were normal. Retinal glioma was diagnosed, and this, the author believes, arose from the inner granular layers of the retina.

The child has remained apparently well for a period of five months, but, properly, he believes that the question of prognosis is still a matter of conjecture.

Tuberculosis of the Skin and of the Uveal Tract: Amputation of the Anterior Segment of the Eye; with Evisceration of the Eyeball.

FROMAGET, Bordeaux. (*La Clinique Cphtalmologique*, 10th April, 1902.) Fromaget reports the case of a fifteen year old boy, with a negative family history, who, with the exception of an operation performed a few months previously for adenoid vegetations, was healthy. In December of 1899, the patient developed an attack of acute pain in the left eye, which lasted for a period of two months. In January, 1900, the pain returned and he was brought to the author.

Examination showed an iridocyclitis, with "seclusion of the pupil," the iris being bombé. At the inner ciliary region there was a marked staphyloma.

Intraocular tension was increased to plus two, and vision equalled finger counting at forty centimeters. An iridectomy was performed, this being followed by a disappearance of the glaucomatous symptoms and an improvement

of vision to one-twelfth of normal. In January of the present year the eye again became inflamed. The cornea was markedly infiltrated and vascularized, and the iris was invaded by grayish products.

The staphyloma had increased in size and had become fungus in appearance. Ocular tuberculosis was diagnosed and sustained by the presence of a few old lupus scars on the limbus and a nodule under the chin.

These lupus lesions dated back about four years, thus preceding the ocular affections by at least two years. and were, therefore, considered as primary and causative of the latter condition.

Under chloroform narcosis, amputation of the anterior segment of the eyeball and evisceration were done, the wound being closed by catgut sutures passed through the tendons of the rectus muscles with an overlying purse-string suture of the conjunctiva. Recovery was uneventful, with the conservation of a good stump.

The author believes that ocular tuberculosis is rare, and that it is usually secondary to pulmonic infection, and that it generally occurs during infancy or adolescence. He thinks that cases similar to the above are infrequent as to the primary cause.

Regarding the treatment of the condition, enucleation is not advised unless the ocular coats are perforated or unless no other important focus is discovered. Where perforation has occurred, the usual treatment of tubercular foci—namely curettement—which in the eye is synonymous with evisceration—is to be followed.

Extraction of Cataract Followed by Erysipelas of the Nose and Face.

NEUSTATTER, Munich. (*La Clinique Ophtalmologique*, 25th March, 1802.) Neustatter reports a case in which extraction of cataract was done in a sixty-one year old patient who was crippled by arthritis deformans and who was suffering from conjunctival catarrh. Extraction was easy and the convalescence was uneventful until the third day, when erysipelas of the face and nose developed, to which the patient succumbed several days later.

The ocular convalescence, however, was uninterrupted except for the failure of the pupil to dilate under atropine—

which is said to have been due to rigidity of the iris tissue.

Unilateral Exophthalmus in Basedow's Disease.

TROUSSEAU, Paris. (*La Clinique Ophtalmologique*, 10th April, 1902.) Trousseau states that unilateral exophthalmus misleads more than it aids in the diagnosis of Basedow's disease, and gives a brief account of the following cases: A fifty-two year old female who was cachectic and nervous, had a rapid pulse and unilateral exophthalmus. She had been studied by several physicians, one of whom diagnosed orbital cancer. Two years later the diagnosis of Basedow's disease was self evident, although the ocular condition remained unilateral. The second case was that of a female aged fifty-six years. Signs of the disease were marked and there was an unilateral exophthalmus with corneal ulceration. The third was that of a case with unilateral exophthalmus in which the patient claimed had appeared first on the left side, to pass away, and appear on the right side.

The author concludes his article by stating that clinicians must cease demanding bilateral exophthalmus as necessary for the diagnosis of such cases.

Atrophy of the Optic Nerves of Saturnine Origin in an Electrician who was Working in a Factory for the Manufacture of Accumulators.

GUIBERT, Roche-sur-Yon. (*La Clinique Ophtalmologique*, 25th March, 1902.) The frequency of lead intoxication in factories for accumulators has been noted by several writers. Guibert reports the following case in which in addition to the usual symptoms, there was a superadded bilateral optic nerve atrophy.

A twenty-nine year old male after working one year in such places developed lead colic. Treatment relieved him in twelve days' time, and he returned to work only to have a relapse a few weeks later. Shortly after this, a sudden blindness developed which disappeared in six weeks' time, leaving a diplopia. There was, however, a doubtful history of acquired syphilis some six years previously, without any obtainable hereditary history.

The patient was a tall, emaciated, and cachectic male who exhibited some cutaneous hyperesthesias. His reflexes

were normal, and there was not any blue line on the gums.

There was an alternating external strabismus, the patient claiming to see better to the sides than straight ahead. The iris reactions were normal. Vision with the right eye was reduced to the one-hundred-and-sixtieth of normal and the left vision to one two-hundredth of normal. The visual fields were concentrically contracted, red and yellow perception alone being conserved and better seen at the field of peripheries. The ophthalmoscope revealed a marked atrophy of the temporal segment of each eye, with an absence of all post-inflammatory signs. Alcohol and tobacco amblyopia could be excluded, as could hysteria and, practically, syphilis; so that the saturnine origin of the amblyopia seemed the most probable. The author believes that better hygienic conditions should be imposed upon such factories.

The Unilateral Ocular Symptoms of Exophthalmic Goiter.

JEAN TERSON, Toulouse. (*La Clinique Ophtalmologique*, 25th March, 1902.) Terson remarks on the limited number of observations made of cases of Graves' disease in which ocular symptoms are unilateral. Some recent writers, he says, omit their mention, while others doubt their occurrence. Thinking that such a belief might lead to dangerous confusion, the author reports the following cases: The first was that of a sixty year old, unmarried woman who, for three months had complained of a feeling of weight and discomfort in the right eye, the vision of which was normal. The fellow eye did not exhibit any change.

Examination of the right side revealed the presence of the von Graefe and Stellwag signs. The pulse-rate was one hundred and fifty and there was a slight tremor of upper extremities. The patient was excitable, and there was slight enlargement of the right lobe of the thyroid gland. She had always been nervous, but the present complaint had developed after some painful domestic troubles.

The second case was in a thirty-three year old, married woman, who complained of a variable prominence of the left eye. The right eye had never given her any trouble. She attributed her condition to worry. Exam-

ination showed an exophthalmus with the presence of the von Graefe and Stellwag signs, together with a diplopia, which was referable to a paralysis of the superior oblique muscle. At the first visit the pulse-rate equalled eighty-six, but at a later visit it was one hundred and two. There was slight hypertrophy of the thyroid gland.

The third case was seen in a forty-eight year old man, who was obliged to discontinue work upon account of cardiac palpitation. Examination showed a slight exophthalmus on the right side, with a contraction of the upper eyelid. The pulse-rate ranged between one hundred and ten and one hundred and twenty, and, although goiter was absent, the diagnosis of Graves' disease was made. Until his death, some twelve years later, there was, practically, never any change in his condition.

The author believes that the various orbital tumors and inflammations may simulate the exophthalmus of Graves' disease, but he thinks that, in any case in which the Stellwag or the von Graefe sign is present, the disease should be suspected.

In its treatment he has found that the prolonged employment of forty to sixty grains, daily, of salicylate of sodium is most excellent.

On Certain Dystrophies of the Cornea and of the Conjunctival Limbus.

PANAS, Paris. (*Archives d'Ophtalmologie*, May, 1902.) Panas reports the pathological changes observed in gerontoxon, pterygium, pinguecula, and chemical keratitis.

Gerontoxon, he says, is the result of a fatty degeneration of first the corneal corpuscles of the stroma, and later of the stroma itsef.

The author believes corneal ulceration has nothing to do with the formation of pterygia, which consist essentially of an hypertrophic epithelial layer overlying a tissue that contains areas of hyaline degeneration with numerous elastic fibres. He removes them by ablation, curettement, and cauterization of the entire corneo-scleral bed, followed by conjunctival suture.

Pinguecula, he thinks, is an involution change and belongs therefore to the same class as gerontoxon and pterygium, into the latter of which it not infrequently develops. It consists, he says, of hyaline degenerative

changes involving the conjunctival stroma, the submucus tissue, and even the episclera.

Chemical keratitis, he states, is a dystrophy which appears in leucomatous corneæ, although it may be found in transparent corneæ which are the seat of chronic irritation. This affection is characterized by him by the deposition in the corneal epithelium. Bowman's membrane, and the superficial corneal stroma of numerous yellowish, or whitish points resembling a precipitate—whence the name. From the staining reactions, he has found that this deposit is apparently hyaline in nature. It may be removed by scraping, followed by the application of hot compresses.

Resection of the Lacrymal Caruncle for the Treatment of Lacrymation.

AUGIERAS, Laval. (*La Clinique Ophtalmologique*, 10th June, 1902.) Some cases of lacrymation, Augieras says, persist even when the lacrymal channels are freely open. In three such cases he has found that the caruncle is too prominent, and thereby compresses the lacrymal canals. Under cocain, he performs excision of the caruncle with perfect and permanent results.

Paracrystalline Termination of a Persistent and Permeable Hyaloid Artery.

VAN DUYSE, Gand. (*Archives d'Ophtalmologie*, May, 1902.) Van Duyse reports the case of a twenty-five year old female who was limited in intelligence. Examination of her left eye revealed the presence of a persistent and permeable hyaloid artery which directed itself forward, downward, and outward, and did not approach the posterior pole of the crystalline lens. Near its anterior end there was a fusiform swelling from the anterior portion of which numerous filaments radiated. From this swelling the sheath continued down and out and disappeared behind the equator of the lens; the presence of a central blood channel being uncertain.

The appearance of the sheath, he says, proved it to be a true adventitial coat.

This case with another previously reported by the author, when considered together with the anatomical work of Hess, the author believes, demonstrate that a persistent hyaloid artery need not have any direct connection with the crystalline lens, or that it may be merely united thereto

by obliterated branches. The paracrystalline direction of the persistent sheath is due, he says, to the traction that is exerted by the organized filaments.

Disposition of the Elastic Tissue in the Sclerocorneal Trabecular System, and the Relation of the Latter with the Sclerotic, the Tendon of the Ciliary Muscle, and the Membrane of Descemet.

VOLLARO, Naples. (*Archives d'Ophtalmologie*, May, 1902.) In these studies Vollaro has employed the Weigert stain for elastic fibres with admirable results. As a result, he says, that the anatomical relations of the sclerocorneal trabecular tissue lead us to consider it merely as a transition zone between the sclerotic and the tendon of the ciliary muscle on the one side and the posterior layers of the corneal stroma on the other. The trabeculæ, composing this tissue however, are not formed from the continuation of the membrane of Descemet, but on the contrary, consist of the endothelium with which it is covered, of a framework of connective tissue resembling tendinous structure, and of an axial part of symmetrically arranged elastic fibres.

This combination of the elastic fibres, he says, assists in maintaining the equilibrium of the circulation of the aqueous humor throughout the trabecular spaces.

The membrane of Descemet was found to terminate abruptly, and there was no evidence of its direct continuation with the sclerocorneal trabecular system.

Paralysis of Accommodation, Following Mumps.

BAGNERIS, Reims. (*La Clinique Ophtalmologique*, 10th June, 1902.) Bagneris reports a case of paralysis of accommodation occurring in a child of fifteen years of age who, three weeks previously, had had an attack of mumps. There was no other ocular complication, and the condition was of brief duration.

The Suppression of Dressing After Cataract Operations.

DE WECKER, Paris. (*Archives d'Ophtalmologie*, June, 1902.) De Wecker says that occlusion of the eyes after the operation is badly borne by many people, particularly by those who are suffering from catarrhal and dacryocystic troubles. In two of the latter type of cases the author was obliged to operate for cataract, and obtained good results; the only dressing used being a narrow band that

was applied vertically over the closed lids and retained in position by some collodion on each end—on the cheek and forehead. He believes the dressing above used is the most preferable, since it acts as a reminder to the patient. He employs repeated instillations of a sterile eserine solution, thus reducing any tendency to iris prolapse and to glaucomatous changes.

Perforation of the Iris; Foreign Body in the Anterior Capsule.

MAZET, Marseilles. (*Annales d'Oculistique*, June, 1902.) Mazet reports the case of a twenty-nine year old man who was struck in the right eye by a small stone chipping, the accident being followed by a low-grade, transitory inflammation and a slight impairment of vision, for which he consulted the author one year later. At this time it was found that there was a minute perforation of the iris and a limited opacification of the anterior capsule, in the center of which there was a brilliant white point—supposedly the foreign body. The iris was uniformly discolored yellow, though it did not show any trace of inflammation other than a slight deposit of pigment at the site of perforation. The change in the color of the iris, he thinks, was probably the sequel of inflammation in its posterior layers, the result of the trauma—since the infection had occurred. He says that, although localized changes of color have been ascribed to chemical alterations taking place in the foreign body, yet they could not have done so in this case upon account of its nature.

Pathogenesis of the Posthemorrhagic Amauroses.

ASSICOT, Paris. (*Archives d'Ophtalmologie*, May, 1902.) Assicot reports the following cases of this condition. The first was that of a forty year old female, whose previous medical history was negative. For two years past she had suffered from headache, vertigo and emesis. A profuse metrorrhagia, lasting six days, developed, followed, two days later, by absolute and permanent blindness, and by a complete subsidence of all other symptoms. Five weeks after this the fundus of each eye showed the typical changes of post-neuritic atrophy.

The second case was in a forty-four year old married woman who developed a profuse metrorrhagia, lasting eight days. Three weeks later complete and permanent blindness rapidly ensued. At that time there was discoloration

of the optic papillæ, with filiform retinal arteries and slight distension of the corresponding veins. The condition at the time of writing, three months later, was that of complete white atrophy of the optic nerves.

Amaurosis following hemorrhage, the author says, occurs most generally in men and between the ages of thirty-five and forty years. It most frequently follows the hematemesis of gastric ulcer. Among women, amaurosis is rare after normal labor, and usually follows an abortion or appears after metrorrhagia at the time of the menopause.

The fundus lesions are included under four classes: First, no change, atrophy later; second, rapid appearance of the atrophy; third, hemorrhagic neuroretinitis as found in albuminuria; and, fourth, papillo-retinitis, terminating in marked post-neuritic atrophy.

Owing to the diverse appearances, the pathogenesis cannot be limited to a single cause. Vascular spasm, endarteritis, lymphstasis and infection have all been advanced as the factors in their productions. It is probable, he says, that the cause is complex, including all of the above mentioned elements.

The Amblyopias of Hepatic Origin.

JACQUEAU, Lyons. (*La Clinique Ophtalmologique*, 10th June, 1902.) The visual complications of hepatic origin are divided by Jacqueau into two groups: First, hemeralopia, and second, amblyopia, with or without central scotoma. The latter affection, the author says, is the more rare. He reports two cases. In both, all other intoxications except those of hepatic origin could be excluded with reasonable certainty. In the first case, together with hepatic enlargement and jaundice, there was a reduction of the vision of the right eye to one-fourth of normal, and of the left eye to one-tenth of normal. The fields of vision and color perception were most excellent. In the fundus of the left eye there were two small points of exudation, situated near the macula. Under the usual hepatic treatment, the vision of the right eye became two-thirds, while that of the left eye arose to one-half. Associated with these conditions, there was a reduction of the hepatic dullness to normal.

The second case was similar, except that there was the addition of central scotomata, with partial paralysis of accommodation. Recovery was practically complete.

The visual symptoms, the author believes, are doubtless the results of the toxic action of retained products; the severity of this intoxication determined the symptomatology.

An especial feature of the treatment, he thinks, is the use of sheeps' liver, which has been so successfully employed by Trantas in the treatment of hemeralopia.

Pathological Anatomy and Pathogenesis of Congenital Keratitis.

TERRIEN, Paris. (*Archives d'Ophtalmologie*, May, 1902.) Congenital opacities of the cornea, Terrien says, are of two kinds. The first is associated with other ocular malformations, and the latter (or pure form) is one in which a diffuse opacity of the cornea is the only manifest alteration.

He believes that the change is the result of intrauterine inflammation, rather than that it is due to an arrest of development. He reports the following case. A full-term child of a mother suffering from nephritis had central corneal opacities at birth. Two days later the author saw the case and determined the presence of porcelain-like opacities which involved the center of each cornea, of which only a two-millimeter zone at the periphery was left clear. The child died of broncho-pneumonia on the eighth day.

The eyes, which were enucleated, were found of almost normal dimension. Macroscopically, the right cornea, except at the center, was much thicker than usual, in which position the posterior surface was deeply eroded. The left cornea was but slightly thickened. Microscopically, the cornea of the right eye possessed a normal epithelium and a Bowman's membrane. In the region of the ulcer the corneal structure resembled that of the sclerotic and was stained deeply from the presence of intense cellular infiltration and numerous small vessels. The anterior layers of the sclerotic, except at the periphery, which was approximately normal, were also swollen, and were the seat of a round-celled infiltration.

The anterior chamber was obliterated. The iris was

deeply infiltrated with round cells, and on its anterior surface there were numerous granulomata. The lens was normal, the chorioid was deeply congested, the retina was the seat of numerous hemorrhages, and the optic nerve was in good condition; but the subdural cavity of its sheath was distended with blood.

This case, the author says, must be considered as one of inflammatory nature and not one of arrested development, since, after the fourth month of fetal life, the cellular elements rapidly diminish in number, and because the eyes under study presented no other anomaly. He believes that the primary change occurs in the uveal tract, the cornea being secondarily affected with destruction of Descemet's membrane, followed by infiltration with aqueous humor and, later, with inflammatory changes in the posterior corneal layers. A second case, in which, with pronounced congestion of the entire globe, a much thickened, although clear, cornea existed, is briefly reported.

The primary cause of the affection, he says, is no doubt some profound nutritional disturbance of placental circulation, as in the first case reported as having taken place from nephritis.

Lesions of the Palpebral Lacrymal Gland in Hypersecretory Lacrymation.

TERSON and LEFAS, Paris. (*Annales d'Oculistique*, June, 1902.) Lacrymation may be due, these authors say, to either hypersecretion or hyperexcretion. Under the former class they include those cases in which the excretory passages are normal. The case reported is of this class, and which was completely and quickly removed by excision of the palpebral lacrymal glands. Microscopic study of the glands revealed a perilobular sclerosis and a granulo-fatty degeneration and necrosis of the glandular cells. There were no marked vascular or nerve lesions, and there were only moderate changes in the larger canals. However, reasoning by analogy to the similar processes affecting the pancrease and salivary glands, the condition, they say, may be ascribed to a subacute infection through the canaliculi.

Note on the Classes of Chamblant.

SULZER, Paris. (*Annales d'Oculistique*, June, 1902.) Sulzer states that lenses formed by two equal cylinders

either convex or concave, crossing one another at right angles, were known before 1820. An article by Goode, published in 1847, states that Chamblant had also ground simple plano-cylinders and unequal crossed cylinders that were intended for the correction of astigmatism.

By the term "glasses a la Chamblant," however, the author designates those which are especially "unequal crossed cylinders."

After a discussion of the physical properties of these glasses, he concludes that in aphakia and in general, in cases in which strong convex glasses are required, bicyclindrical glasses are preferable to the bispherical. The former, he says, are rectilinear for lines that are parallel to their axes, while the latter deform parallel lines into the shape of a barrel; and second, that in the correction of astigmatism, crossed cylinders are preferable to spherocylinders, because by changing the relative position of their axes an infinitely larger series can be obtained.

Some Observations on Sympatheticectomy in Glaucoma.

ROHMER, Nancy. (*Annales d'Oculistique*, May, 1902.) Rohmer details the histories of seventeen cases of glaucoma in which he has done sympathectomy. Adding these to the seventy-four collected by Bichet, he obtains sufficient data to make the following observations: The operative results of resection of the superior cervical ganglion are of two kinds—immediate and remote: The immediate results are a blanching of the face and the eye, and a slight slowing and weakening of the pulse. Respiration, he says, is not affected. The ocular tension becomes decreased, often below normal. In about five hours after the procedure, a conjunctival injection which disappears in about a day's time, becomes apparent. At this time, lacrymation and increased nasal discharge may appear.

The remote, and usually permanent results of the procedure, are, the diminution of tension, usually passing to below normal and then rising to a permanent normal on the following day: Even in unfavorable cases, the tension remains lowered for several days. The pupil becomes contracted immediately or shortly after the operation, attaining a permanent maximum in twenty-four hours' time. Vision returns quickly and rapidly (in one case progressing from blindness to two-thirds in twelve days' time).

Increase in the power of accommodation may at times be noted. The visual fluids become enlarged to almost normal, that is, if there is not any atrophy of the optic nerve fasiculi. Slight ptosis and enophthalmus persisting for several months' time have been noted.

The periorbital pain and cephalagia often disappear rapidly and permanently, but at times may quickly return.

The following untoward results have been noted: Development of an acute attack of glaucoma from the simple or chronic type, but of course this cannot be definitely ascribed to the operation. In five of the cases reported by the author, neuralgic pains in the shoulders, the neck, and the side of the face developed from three to fifteen days after the operation. These pains were intermittent in character and varied in duration, slowly disappearing in a few weeks to a few months' time, and not bearing any relation to the form of the glaucoma. In two cases there was difficulty in deglutition. These complications, he says, may be ascribed to disturbance of the cervical plexus, to vasomotor changes, and to the destruction of the anastomosing branches uniting the superior cervical ganglion to the trigeminus, glasso-pharyngeal, and pneumogastric nerves.

The permanency of the favorable results obtained is not yet definitely settled, although several cases have been followed from one to three years' time, during which time the relief obtained has remained unchanged.

The best results, he says, were gotten in chronic simple glaucoma, five-sixths of this type of cases being ameliorated. Chronic inflammatory glaucoma was bettered in two-thirds of the affected cases. Five hemorrhagic cases were improved, while the acute and subacute forms were least helped. In these last types, he believes that sympatheticectomy should only be employed after failure of iridectomy.

In performing the operation, the author employed the retromastoidian route, making the incision along the posterior border of the sternomastoid muscle through the deep cervical fascia. This done, the superior cervical ganglion was easily found by blunt dissection. In one case, the author entered the pharynx, but no complication resulted.

The operation is not considered dangerous or particularly difficult.

The Prognosis of Certain General Diseases According to Some of their Ocular Manifestations.

De Micas, Toulouse. (*La Clinique Ophtalmologique*, 10th June, 1902.) De Micas briefly enumerates a few of the ocular complications of general disease. In most instances the presence of ocular changes is against a favorable prognosis. In pneumonia, however, pupillary inequality with mydriasis more marked on the side of the lession, and appearing early and persisting, is a good symptom.

Angiosarcoma of the Retina.

Teillais, Nantes. (*Annales d'Oculistique*, May, 1902.) Teillais believes that the classic phrase "glioma is the only neoplasm to be observed in the retina," is not any longer satisfactory. He say that the observations of Greeff with the Golgi-Cagal method force us to believe that retinal glioma is much less frequent than retinal sarcoma. The history of a case reported by him is the usual one seen in a case of malignant ocular tumor of childhood, enucleation being followed by speedy death.

The enucleated eye was hardened in formalin. The growth filled the vitreous chamber and prevented a marbled aspect throughout. The tumor-mass was composed of perivascular tubes formed by round cells at the periphery and epithelial cells in the center, these tubes being separated by zones of more or less marked degeneration. The part of the neoplasm developing at the expense of the chorioid contained larger and more deeply staining cells held in the meshes of an abundant reticulum. The vessels were more numerous in the portion that was situated within the pigment epithelium and had the appearance of lacunæ—some of which possess very thin walls. Interstitial hemorrhages were frequently seen.

Suppurative Keratitis of Infectious Origin.

Panas, Paris. (*Archives d'Ophtalmologie*, June, 1902.) The keratites of this class, Panas says, occur in three forms: First, serpiginous ulcers accompanied by typical hypopyon; second, ulceration with atypical hypopyon; third, marginal creeping ulcer, rarely accompanied by hypopyon. He reports one pronounced example of each

class. Under treatment with methyl violet, iodoform ointment, hot compresses and atropine, exceptionally good results were obtained in all.

The observations of Uhthoff and Axenfeld, he says, demonstrate the presence of the diplococcus pneumoniæ, either alone or associated with other bacteria, in the majority of these cases. Nedden has described a small diplobacillus as found associated with multiple or single marginal corneal ulcers. The colon bacillus has not been detected as yet in hypopyon-keratitis, other than in a case that has been reported by Nedden. The aspergillus fumigatus has been seen in cases of keratomycosis by different authors, the ulcer-surface being dull and dry and studded by a grumous mushroom massing resembling a deposit. The staphylococcus, the streptococcus and the xerobacillus have also been found, but usually in mixed culture.

He states that Uhthoff and Axenfeld say that the membrane of Descemet is perforated almost always late, and that the hypopyon is free from bacteria until after such perforation has occurred. The endothelial covering is often lost early and, hence, assists in the formation of the hypopyon, which arises primarily from the inflammatory exudates from the iris and ciliary body. Fuchs, however, he says, stated, as late as 1898, that the membrane of Descemet is perforated before the destruction of the deep corneal stroma layers. Petit, he informs us, has reported a case in which Descemet's membrane had remained intact; and in an analysis of the Fuchs-Elschnig series, he believes that the early perforation of the Descemet membrane might be explained by the presence of chronic glaucoma in eight of the ten cases. The experimental work of Andrejero failed to reveal any perforation in any of the sixty-three cases studied.

After an enumeration of the predisposing causes and of the symptoms, the following indications for treatment are given: First, sterilize the colonies of pathogenic microbes which have invaded the corneal parenchyma; second, remove the hypopyon; and, third, re-establish the pupillary field, which is habitually obstructed by plastic products and false membranes.

In early and in mild cases the first two indications are fulfilled by the use of one to twenty thousand strengths of

biniodide of mercury; of one to ten thousand strengths of bichloride of mercury; or of one to five thousand strengths of cyanide of mercury, followed by the instillation of two or three drops of a one to five hundred strength solution of methyl violet. At the same time an iodoform pomade may be introduced into the cul-de-sac. Hot compresses are also valuable adjuvants.

If these measures fail, the ulcer may be burnt by the actual cautery and the hypopyon evacuated by means of a free peripheal corneal incision. The Saemisch form of section is not recommended, because of the frequent necessity of reopening it and the difficulty of completely removing the hypopyon by it. In the presence of a relapsing hypopyon, due often to a retention of pus in the posterior chamber, a large iridectomy, with intraocular irrigation with biniodide of mercury, may be performed. Subconjunctival injections are advantageous only in certain cases, and then only as revulsants and not as germicides. Local applications of tincture of iodine are highly recommended by some authors. Romer, he says, claims that beneficial results have followed the experimental and clinical use of antipneumococcic serum injected both subconjunctivally and hypodermatically.

Influence of the Excitation of the Cervical Sympathetic on the Uniformity of the Refraction of the Eye.

TERRIEN and CAMUS, Paris. (*Archives d'Ophtalmologie*, June, 1902.) Terrien and Camus, from experiments on rabbits conclude; first, that excitation of the cervical sympathetic after section gives rise to an augmentation of the refraction of the eye on the corresponding side, this augmentation being slight and varying between one and two and a half diopters'; second, this phenomenon does not correspond with a dilatation of the pupil, but commences later and subsides sooner. The cause of this condition, they state, is not yet known.

Fibrochondroma of the Orbit. Extirpation by the Superior Cul-de-Sac with Conservation of the Globe and the Retention of Vision.

FROMAGET, Bordeaux. (*Archives d'Ophtalmologie*, June, 1902.) Fibrochondroma of the orbit, Fromaget says, is very rare, the only case previously reported according to him, being that of Fano in 1859. The author gives the

details of the following case. An eighteen year old female with a negative medical history except for her present trouble, which began eight years previously, and had increased slowly, came to him with the following condition: The left eye was markedly displaced downward and forward, and pushed slightly outward. Its vision was reduced to one-third, though the fundus appeared normal. Diplopia was not troublesome, but was present in all but the downward rotation.

Digital examination revealed the presence of a dense nonpulsatile tumor attached to the upper posterior wall of the orbit. Under chloroform narcosis, the external canthus was divided and the superior cul-de-sac was incised from one end to the other. The tumor was found firmly adherent to the osseous wall except at the inner extremity, from which it was separated with difficulty. After the removal of the growth, the eye immediately sank into the orbit as if it had been retracted by rubber cords. The canthus was sutured and the cul-de-sac was left open for drainage. Convalescence was interrupted. Vision returned to two-thirds of normal, diplopia was greatly lessened, and the resulting ptosis from relaxation of the eyelid was not marked.

Macroscopic examination of the mass revealed a tumor-growth of four by two by two centimeters' size. It had an irregular and yellowish surface corresponding with the pressure areas of the surrounding parts. Section showed that it was surrounded by a reddish capsule one-half to three millimeters thick. Microscopic examination proved the presence of islets of connectlve tissue contained numerous blood vessels. Throughout the tumor-mass, both within and outside of these fibrous islands, there was a cartilaginous tissue in which ramifying and round cells were present to equal degrees. A small amount of fatty and mucous tissue, as well as one minute area of degenerated striated muscle tissue, were also present.

Krönlein's operation for the removal of tumors within the muscular cone is recommended by the author.

ABSTRACTS OF GERMAN OPHTHALMIC LITERATURE.

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(Quarter ending June 30, 1902.)

Pigment on the Iris and Descemet's Membrane as an Early Sign of Chorioidal Sarcoma.

FEHR, DR. (*Centralblatt für praktische Augenheilkunde*, May, 1902.) The case which is described by Fehr was first seen in the fall of 1899, and at this time showed symptoms which suggested glaucoma. There was some indistinctness of vision, rainbow appearance around a light and a sense of pressure in the eye. The increased intraocular tension was not demonstrable to touch and the visual field and acuity were normal. The remarkable thing however about the case was the appearance of the iris and of the membrane of Descemet. Both were covered with fine pigment points which were arranged in either lines or in little patches. These changes remained practically unaltered for more than a year when the patient returned with diminished visual acuity and constricted field. Dilatation of the pupil showed a large melano-sarcoma upward and outward and close behind the lens. He seems to think that a tumor in this location, that is to say well forward in the anterior part of the eye, will be more apt to be preceded by changes such as these than when it is located far back in the eyeball, and that when such changes are observed close scrutiny should

be made of that part of the eye immediately behind the lens. He of course refers to the fact that these pigment deposits are found in other pathological conditions and even in normal eyes.

Treatment of Tuberculosis of the Iris and Cornea by the Injection of Atmospheric Air into the Anterior Chamber.

KOSTER, DR. (*Klinische Monatsblätter für Augenheilk.*, April, 1902.) The author by this treatment has been able to bring about a cure when other measures completely failed. The anterior chamber is first emptied of some of its contents and then the air is forced in from a Pravaz syringe. Four injections of air usually suffice to cure. He suggests this treatment in tuberculosis of the chorioid.

Contribution to the Treatment of Hypopyon Keratitis.

ZIRM, DR. EDUARD. (*Centralblatt für praktische Augenheilk*, March, 1902.) The author has discarded entirely the bandage in these cases as being an obstacle to the lid movement and causing a collection of the secretion in the conjunctival sac. He uses a wire gauze mask, such as is used after cataract extractions. He used to keep such patients in bed but now they are allowed to go all about. Rest in bed has a tendency to interfere with the metabolism of the body in general. Every two or three hours sublimate vaseline (0,01:50) is rubbed in the conjunctival sac instead of irrigating the conjunctiva with a sublimate solution as formerly. Dusting with iodoform has been abandoned and instead a small quantity of xeroform powder is dusted over the ulcer. It is of course understood that every septic ulcer is treated with the galvano-cautery. Through these measures he has usually cured his patient and rarely has he found it necessary to resort to the Saemisch incision, which he regards as a more or less risky procedure. He claims for this treatment, comparative freedom from pain, rapid cessation of the progress of the ulcer and as a result the scar which is left is rarely a large one. We rarely see anterior synechiæ as we do after making the Saemisch incision. In many of Zirm's cases good vision was obtained. Failure only occurred in three cases and in these three other factors were at work. Of course atropia was used and also moist heat.

Post-Operative Detachment of the Chorioid.

FUCHS, PROF. (*Archiv. für Ophtalmologie*, LIII Band,

3 Heft.) The author reminds us of the fact that this condition is much more frequent than is usually supposed. He analyses twenty-three cases of detachment of the chorioid after cataract extraction and fourteen cases after iridectomy. He has never observed this complication after a simple linear extraction of either soft or of membranous cataracts. There is a marked frequency noted after iridectomy for glaucoma. It will be remembered, perhaps, that Fuchs has stated that a symptom strongly suggestive of this condition is seen when the anterior chamber, after filling up after the operation, suddenly becomes shallow and sometimes is actually obliterated. An ophthalmoscopic examination will reveal the detachment. He discusses, at considerable length, the factors which contribute to the causation of the condition, among which factors may be noted the age of the patient, which means greater rigidity of the sclera, and also the character of the section made by the Graefe knife. In those cases where section was made for glaucoma the chief factor was the elevated tension. The length of time after the operation before the appearance of the detachment ranges from one day to sixteen days, and the condition lasted from one to thirty days. The detachment was found, as a rule, on either the temporal or nasal side. Detachment either above or below is very rare. The detachment arises from a rent at or near the root of the ciliary processes, in which case the fluid beneath the chorioid is aqueous humor. It can be caused by traction on the chorioid; and the fluid, in this case, is transuded serum. Rupture of the chorioidal vessels can also give rise to detachment, in which case the fluid is blood; or the detachment may be caused by an inflammatory effusion, which is, of course, an exudate. The extent of the detachment depends upon the quantity of the fluid or upon the strength of the traction, also upon the resisting power of the vorticose veins which bind the chorioid to the sclera. The detachments which arise from traction on the chorioid have a bad prognosis, while those which arise from a rent at the ciliary processes have an excellent prognosis. Hemorrhagic or exudative detachments can become attached, but a complete restitution to health is rarely seen.

Node-Like Clouding of the Cornea.

FUCHS, PROF. (*Archiv. für Ophtalmologie*, LII Band, 3 Heft.) This affection, as described by Groenouw, has the following characteristics: It consists in the appearance in the cornea of small, round, gray, non-confluent cloudings. The large cloudings have a diameter of $^1/_4$ mm. and between them lie dust-like cloudings, or gray points. The changes occupy usually the central parts of the cornea, leaving the periphery more or less clear. The large points push up the corneal tissue to a slight extent and cause, in this way, a slight curve in the corneal surface. These cloudings exist without inflammatory symptoms, and they may remain unchanged for years. It is certainly a very rare affection, for Fuchs has only observed eight cases in twenty thousand new patients. These cases the author describes in detail. His description does not differ materially from that given by Groenouw. The etiology of the disease is very obscure. In the anatomical examination which Fuchs had an opportunity of making he found no evidences of inflammation, but, rather, of a degeneration which, in his opinion, is the expression of some general disturbance in the nutrition of the cornea, the exact nature of which is not known.

Intraocular Galvano-Cauterization.

ROSCHER, DR., Breslau. (*Münch. Med. Wochenschrift*, March 25th, 1902.) Three years ago, it will be remembered by many that Van Millingen published a report of three cases in which he had employed this method and had succeeded in saving the eyes from panophthalmitis. The patient is given a general anesthetic and the glowing end of the platinum point is carried right into the vitreous after the edges of the wound have been well burnt. It is moved here and there within the vitreous and then promptly withdrawn. The duration of the application is from three to four seconds and the depth of the entrance is from four to eight mm. The scleral wound is then closed with stitches, atropine is instilled and a bandage is applied. All three cases healed beautifully, giving vision $^1/_2$, 1 and $^1/_5$.

Roscher has repeated this method in two cases of severe injury. In the first case the symptoms were so fulminating in character that he was obliged to enucleate, but in the other he was enabled to preserve a shapely eye,

though it was sightless. He refers to several cases which were successfully treated by Eversbusch, Baumler and others, and with good results. Roscher employed the method in a case where extraction had been performed and where infection had followed on the seventh day. The treatment is evidently of value. It is clear that the method deserves consideration. It goes directly to the spot without having to pass through the entire system, as is the case with iodide of potash and the mercurial ointments.

Dionin.

(*Die Heilkunde*, 1902, 2.) Extracted from Wochenscrift fur Therapie und Hygiene des Auges No. 26, 1902, by DR. LUNIEWSKI. I have more than once mentioned the results which have been obtained by various investigators with this drug. The conclusions of the author, based upon a clinical and experimental study of its effects, are as follows: It produces a more abundant flow of blood plasma in the stroma, and the result is that a certain amount of pressure is exerted upon the yielding walls of the veins and we have, as a result of this, venous stasis and an acceleration of the lymph circulation throughout the eyeball. The pressure which is exerted upon the veins is also exerted upon the nerves, and we have a certain amount of paresis, which explains the analgesic effect. The drug, then, is indicated when we want to bring about a quick resorption of either inflammatory products or of serous exudates. It is also indicated when we wish to get prolonged anesthesia of the eye. It is contraindicated in old people with arterio-sclerosis. He calls attention to the frequency of sneezing after the use of dionin, a result which depends upon the more or less patulency of the canaliculi and upon the peculiar susceptibility of the nasal mucus membrane. Contrary to the views of Darier and others, the author finds that the pupil is made smaller by the instillation of dionin. He has found that dionin acted most favorably in retinal detachment due to serous effusion.

Spontaneous Disappearance of Cataract Produced by a Penetrating Wound of the Vitreous Body.

BONDI, DR. M. (*Wochenscrift für Therapie und Hygiene des Auges* No. 29, 1902.) The author reminds us that few

cases of this kind have been reported. The patient was a mechanic who had been wounded in his left eye by a small piece of steel. There was some doubt at first as to whether the piece of steel penetrated the eyeball. A small linear wound of the cornea and a corresponding one of the anterior capsule of the lens were discovered. A well marked star-like clouding of the lens was seen in the posterior cortical substance. There were vitreous cloudings, and Bondi was convinced that the foreign body was present within the eyeball. This was shown to be the case, and it was removed with the magnet. The vision was $^4/_{10}$ and the tension somewhat lower than normal. In a year he was seen again, and, with the exception of the slight linear scar in the capsule, which was only visible with a strong lens, the entire lens was clear, the star-shaped figure having disappeared. Vision was six-tenths, with a stenopaic slit.

A Contribution to Subconjunctival Discission of Secondary Cataract.

WOKENIUS, DR. H. (*Zeitschrift für Augenheilk.*, April, 1902.) The author is an assistant in the Königsberg eye clinic and has had many opportunities of witnessing the work of Kuhnt in this field. We know that our usual methods of dealing with secondary cataracts are far from satisfactory. Wokenius discusses the various methods of operating upon this variety of cataract and points out the disadvantages peculiar to each method. He declares that Kuhnt's method is absolutely safe. Kuhnt has devised a special knife for this operation. According to Kuhnt, the capsular shreds should always be separated in a perpendicular manner, for in this manner we avoid penetrating, to any extent, the corpus vitreum and no traction is made upon the ciliary region. Perfect artificial light should be used for illumination. The operation is performed in the following way. The eye is first prepared and atropinized. A careful inspection is then made to determine where the capsular membrane should be incised. The knife is passed into the conjunctiva from three to four mm. from the limbus, on through the sclera and into the very periphery of the anterior chamber. The knife is always kept parallel to the plane of the iris and is carried in the pupillary opening and right into the capsular membrane.

A light sawing motion is then made, extending from the pupillary border of one side to that of the opposite side. The knife is then withdrawn through the same opening. Generally speaking, one cut is sufficient, and it should be from seven to nine mm. long. The reaction amounts to practically nothing. It is almost impossible (if the operation is properly done) to wound the corpus vitreum except in the most superficial layers, and we never see the harmful striæ in the vitreous so frequently seen after operations for cataract. Two hundred and sixteen secondary cataracts were operated upon in this way and infection never occurred and, at the same time, vision was never made any worse—a thing which we can't always say of other operations. On the contrary, there was marked improvement in vision in most of the cases. Glaucomatous attacks were never observed.

The Use of Citrate of Copper in Trachoma.

V. ARLT, DR. F. R. (*Centralblatt für praktische Augenheilk.*,, May, 1902.) Von Arlt has had such excellent results with citrate of silver as substitute for nitrate of silver that he has been recently trying the citrate of copper. He uses the agent in the form of a salve 5 to 10 per cent. mixed with glycerine and starch. It is applied on the end of a glass rod and is rubbed in the conjunctual sac. The lids are then closed and massage is employed for about half a minute. The pain is slight and transient. The treatment should be repeated two or three times daily. It is a great advantage that the patients can employ the treatment themselves. He refers to three cases of pannus in which the trouble disappeared in from seven to twelve days. Corneal ulcers forbid its use so also when the individual is taking iodide of potash.

The Jequiritol Treatment.

HUMMELSHEIM, DR. (*Zeitschrift für Augenheilk.*, April, 1902.) The author reviews the recent literature on this subject and refers particularly to the contributions of Romer and Krauss. His experience simply confirms the observations of the last mentioned observers. He concludes that we possess in jequiritol an agent with all the valuable properties of jequirity and it has a decided advantage over the latter in that it is possible to make a

more accurate dosage with it than with jequirity and lastly we avoid inflicting any permanent injury upon the eye.

Three Cases of Double-Sided Pneumococcus Infection of the Eyes following the Measles.

HERTEL, DR. E. (*Archiv. für Ophtalmologie*, LIII Band, 3. Heft.) In all three cases the eye trouble was the closing scene in the measles. All three patients had pulmonary complications. In one case there was corneal perforation and sloughing and both eyes had to be exenterated. In the second case perforation occurred promptly in one eye and in the other eye just before death. In the third case there was slight corneal involvement, but no marked ulcer, though there was more or less ulceration of both the palpebral and bulbar conjunctiva. The cases resembled one another closely in that the pneumococcus was found in the conjunctival secretion and in both the corneal and conjunctival ulcers.

A Further Conrtibution to the Pathogenesis of Alcohol Amblyopia.

BIRCH-HIRSCHFELD, A. S. (*Archiv für Ophtalmologie*, LIV Band, I. Heft.) The author has again been engaged in a series of experiments upon this very interesting subject. His conclusions may be presented as follows: He is of the opinion that marked changes in the ganglion cell layer of the retina are always observed before we notice any pathological changes in the optic nerve. The changes in the retina are not circumscribed in character, but are scattered quite uniformly over the retina (that is to say in the ganglion cell layer) and since in this stage changes in other parts of the retina are absent, we are forced to the conclusion that there is a direct influence exerted by the poison upon the ganglion cells. He regards any involvement of the optic nerve as an independent matter and in no way secondary to the retinal changes and he gives good reasons for his opinion. Inasmuch as neither in the connective tissue septa nor in the neuroglia were there any evidences of proliferation, the toxic action must have been exerted primarily upon nerve substance itself and not upon the interstitial tissue. But in these cases the degenerative changes are not like those due to other causes, that is to say nerve fibers in the same bundle are not all equally affected, for in those bundles which had

undergone pronounced changes there were often to be found normal fibers. This degeneration he does not regard as being caused by edema but as due to the direct action of the poison upon the nerve fibres, the poison being carried to the nerve fibers through the system of lymph-spaces. One would infer from his work that the author holds that the most important changes are located in the optic nerve and in this particular his views coincide with those of Uhthoff. The optic nerve change does not consist in a primary interstitial inflammation, but in a primary affection of the nerve fibers due to the direct action of the poison as has been stated, together with secondary involvement of the interstitial tissue.

Iodides in Choked Disc.

FISHER, DR. JOSEPH, Laibach. (*Wochenschr. für Therapie und Hygiene des Auges*, No. 31, 1902.) Fisher reports eight cases of neuritis where the iodides were taken internally (either the iodide of potash or the red iodide of mercury was used). It is clear that there are cases of optic neuritis which are so markedly influenced by the iodides that the swelling entirely disappears and the vision promptly gets better. This is not difficult to understand on the assumption that there is an intracranial tumor present. Experience has also taught that the red iodide is more valuable than any other form of the drug for large quantities are more readily borne.

Marasmic Amblyopia and Asthenopia.

KLEIN, DR. S. (*Wiener klinische Wochenschrift*, No. 19, 1902.) Under this new designation the author describes an affection which he has observed at the age of fifty-six and upward. The ophthalmoscopic examination is negative and there is apparently no break in the visual field while there is a marked loss of visual acuity and of accommodative power. Glasses do not seem to help. The author regards the condition as a high grade of general exhaustion.

A Clinical and Bactoriological Study of Marginal Ulcers of the Cornea.

DR. ZUR NEDDEN. (*Archiv für Ophtalmologie*, LIV Band, I. Heft.) The author first speaks of the great amount of

bacteriologic work which has been done in connection with the conjunctiva and reminds us that comparatively little has been done upon the bacteriology of keratitis with the exception of serpent ulcer. He has made systematic examination of a number of cases of marginal keratitis and he has found a bacillus generally present, a bacillus which has not hitherto been described. This organism has occasionally been found in other varieties of corneal disease. He describes this bacillus in detail, giving its morphological and cultural properties. A description then follows of the clinical picture of marginal keratitis, which disease consists in an ulcer varying in extent from 1—2 mm. long and 1 mm. broad and with which we are all more or less familiar. He reports thirty-three cases. He concludes by dividing the marginal ulcers into two groups. The secondary ulcer follows phlyctenular conjunctivitis and is often seen as a result of blenorrhea of the conjunctiva. The primary form is frequently of unknown origin, though Fuchs explains these cases as being doubtless of gouty origin. Among the primary forms come those cases in which the bacillus is found, the bacillus to which reference has been made. We have two kinds of this latter variety, the infected area being either isolated and sickle-shaped or we may have a number of isolated groups of infiltrations.

May Keratitis be Caused by Ergotin?

Hennicke, Dr., Gera. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 32, 1902.) Some four years ago the author reported an epidemic of ophthalmia among some of the animals in the zoological gardens in his city. The symptoms were those of a very intense keratitis. He concluded that the disease was caused by the food which he found to contain large quantities of ergotin. The following case in a human being only served to strengthen this view of the matter. The patient was a woman forty-three years old who complained of bad vision in the right eye. She thought she had caught cold. The vision in this eye had been reduced to one-half. The ophthalmoscopic examination was negative. The ciliary vessls were slightly engorged and there was a very marked parenchymatous clouding of the cornea shaped somewhat like a

pterygium with the apex directed toward the center of the pupil, This clouding was not completely opaque, but showed here and there normal transparent points. The general history was negative. It appeared that the patient had been taking for metrorrhagia twenty-five drops of ergot three times daily according to the directions of her family physician. This she had been doing for ten days. No treatment was suggested except warm applications which were employed simply as a placebo. The clouding rapidly cleared away. At the time of the next menstruation she was ordered again to resume the ergot which she did and again the corneal clouding made its appearance with marked visual disturbance. The ergot was at once stopped and the corneal trouble began to disappear. He attributed the corneal disease to disturbances in the general nutrition of this locality caused by the ergotin.

A Case of Panophthalmitis Following Cataract Extraction Cured by the Introduction of Iodoform Into the Interior of the Eye.

Schmidt, Heinrich, Dr. (*Zeitschrift für Augenheilk.*, April, 1902.) I have more than once alluded in these Annals to the observations of Haab, Mayweg, Goldzieher and others in connection with this method of treating intraocular infections. Schmidt reports a very interesting case of cataract extraction where thirty-six hours after the operation panophthalmitis made its appearance with pus in the anterior chamber. Inasmuch as treatment in these cases is of no avail, Schmidt adopted the procedure of opening the anterior chamber, cleaning out the pus and introducing a small iodoform disc into the anterior chamber. Improvement was rapid and substantial and in a month the patient could read ordinary print and with convex 10 D, had a distant vision of one-fourth. It would seem as if the method were applicable to those cases in which our usual methods have been shown for a long time to be inadequate.

A Hitherto Unrecognized Functional Disturbance in Neurasthenia and Hysteria.

Königshöfer, Prof. (*Die Ophtalmolog. Klinik*, 20th

April, 1902.) Spasm of convergence, insufficiency of the interni, spasm and weakness of accommodation are conditions which are not infrequently observed in hysteria and neurasthenia. The characteristic point which Königshöfer brings out in the cases which he reports is that the patient is unable to steadily fix an object, and it makes no difference at what distance the object is located. Every effort at fixation is attended with a sensation as though everything were swimming in front of the patient. Generally speaking, the patient presents the typical evidences of hysteria, such, for instance, as anesthesia of half the body, globus hystericus, hysterical attacks, generally at the menstrual epoch, circulatory disturbances, etc. He reports five cases, all characterized by pronounced diminution in the range of binocular accommodation and somewhat less in the case of the range of monocular accommodation. Homonymous diplopia is observed, and the greater the distance, the further apart the images. Monocular vision in a more or less small zone which corresponds to the distant point of the eyes at the moment. Crossed diplopia when the object is brought very near, and the less the range, so much the nearer does the fusion point lie to the distant point. The condition then seems to be one where an adjustment of the visual axes and of the accommodation for near and for distant objects is only possible to a very limited extent. He calls the condition "convergence rigidity."

The Most Judicious Way of Correcting Myopia.

Schreiber, Dr. P. (*Klin. Monatsblaetter für Augenheilk.*, March, 1902.) He is of the opinion that myopia progresses between the seventh and fourteenth years and, consequently, he advises the complete correction of the myopia if it is over 1.25. Myopia of 0.50 does not call for correction. A myopia greater than 1.25 and up to 6.50 should be fully corrected, because, without the full correction, the patients are unable to follow satisfactorily the demonstrations at the blackboard. The glasses should be set in spectacle frames and any astigmatism should also be corrected. In making a full correction, a sufficient range of accommodation should be allowed—

sufficient, say, to allow an approximation of objects up to 2.5 dm. If this is not possible, the next weaker glass should be chosen. Weakness of the interni is favorably influenced by full correction. In myopes over twenty years of age who have never worn full correction, it is not his rule to make a full correction, because experience has taught that myopia, at this age, is stationary, and also because, in myopia of the higher grades, full correction is not usually tolerated on account of the micropsia and asthenopia which are often produced. From the fortieth year on, presbyopia is always to be considered and, for reading, a weaker concave glass (say from 2.50 to 3 D. weaker than the distant glass) should be employed. When the myopia is less than 3 D., no concave glass is necessary for reading. If the myopia, with full correction, continues to progress, constitutional treatment is in order.

Given a Wound of the Eye, Can We Get an Inflammation in This Locality from the Presence of a Toxin in the General Circulation.

SCHMAMORA, DR., Japan. (*Klinische Monatsblaetter für Augenheilk.*, April, 1902.) Tornatola, as we know, produced injuries of the cornea and iris and then injected the toxin of bacillus coli communis and the extract of staphylococcus aureus into the circulation and claimed that he obtained, as a result, a marked inflammation of the eye wound. The question is, Does the inflammation result from endogenous or from ectogenous causes?

He endeavors to control the results of Tornatola in a large number of experiments on animals. He found that there is no reaction in the wound of the eye when the toxin (obtained by filtration) of bacillus coli communis or of staphylococcus aureus was injected either into the vein or into the peritoneum, even when the injection was repeated over and over again. Of course, the wound of the eye must be made in such a location that secondary infection from without may be excluded. He claims that, in Tornatola's cases, infection came from without. His work, then, goes to disprove that of the first observer.

The Bacteriology of Panophthalmitis. A Report of Three Cases.

HIROTA, K., DR., Tokio. (*Zeitschrift für Augenheilk.*,

June, 1902.) The author has recently made bacteriological examination in three cases of panophthalmitis which came under his observation. In all three cases he found the pneumococcus in either pure or almost pure culture. His results confirm those of Gasparrini, Uhthoff and others. In all of his cases there was dacriocystitis. It is known that sympathetic ophthalmia is usually absent in such cases and those who believe in the parasite origin of this disease explain the absence of sympathetic ophtalmia in panophthalmitis on the assumption that the bacteria die as soon as the pus is evacuated, but Hirota has shown that fourteen days after the evacuation of the pus, living pneumococci may be obtained from the interior of the eye.

Does an Individual who has Lost an Eye Lose any Working Efficiency?

MAKLAHOFF, DR. (Bericht über die ophthalmologische Section der VIII Pirogoff'schen Versammlung in Moskau, extracted from *Zeitschrift über Augenheilk.*, June, 1902.) The author shows by an examination of sixty-two mechanics (mostly weavers and spinners) that forty-five earned just as much as the seventeen who had both eyes. He makes a report upon twenty-two workmen, each of whom had lost an eye from injury. Of these twenty-two twelve had regained their early efficiency and in four cases it seemed that their efficiency was increased. In six cases the efficiency was less and in four absolutely lost. He thinks that a workman with one eye is quite as efficient as the one with two.

The Ophthalmoscopic Diagnosis of Sclerosis of the Retinal Vessels.

DR. E. RACHLMANN. *(Zeitschrift für Augenheilk.*, June, 1902.) The author analyzes fifteen cases with reference to the ophthalmoscopic changes in the retinal vessels. The most important changes are as follows: A sharply circumscribed disc is usually seen. Marked changes are usually seen in the veins, for example the author describes a condition where the vein is much constricted and where there is apparently an interruption in the blood column and where the latter is simply reduced to a thread in size.

Further on the vein may become three times as large and assumes a more or less tortuous course. The arteries show aneurysmal like dilatations or varicosities and between these points the bloodvessel is a mere thread. Sometimes the arteries are very tortuous and show delicate pulsations. There is often more or less haziness about the wall of the artery. The veins were, generally speaking, dilated, and the peripheral portions of the veins especially in the very old were apt to be much broader than in the region of the papilla and sometimes the veins would show oval-shaped enlargements. These conditions of course would interfere to some extent with the blood current as evidenced by the minute hemorrhages often seen in the vicinity of the constrictions. In general arterio-sclerosis the changes in the retinal vessels are usually found present to an equal degree in both eyes. Endarteritis may be properly assumed as responsible for the principal features of the ophthalmoscopic picture. The author makes the statement that while he has very often met with the arterial pulsation in arterio-sclerosis he is more impressed, however, with the frequency of the so-called progressive pulsation of the veins, a conditian which is especially noticeable when the arterio-sclerosis is complicated with heart trouble.

Poisoning by Oxide and Dioxide of Chlorine.

GRAEFE, A., DR., Berlin. (*Deutsche Med. Woch.*, 1902, No. 11, p. 191.) At a meeting of artists numerous photographs were taken with flashlight in a small room. Immediately afterward a member returned into this room and soon was found unconscious. Low pulse, 50, pain in temples and occiput, dead feeling in hands and feet, breathing very much impaired. G. found maximal bilateral mydriasis, paralysis of left abducens. Equator of both lenses opaque with intermittent light and dark streaks, diffuse opacity of center. Fundus, as far as visible, apparently normal. Snellen XXX uncertain at 10 to 16 inches. The flashlight preparation contains magnesia and chlorate of potash which develop, by explosion, oxide and dioxide chlorine: $KClO_3 + MgO = MgO + Cl_2O + KClO + ClO_2$, which are very poisonous, and were the cause of intoxication in this case. After nine weeks paralysis of abducens and accommodation had subsided, mydriasis

diminished. The opacities of both lenses disappeared entirely, except a few radiating opacities at equator, which, however, may have existed previously. The treatment consisted in roborants, alcohol and dark glasses.

An Unusual Cataract Operation.

HIRSCHBERG, J., PROF., Berlin. (*Deutsche Med. Woch.*, 1902, No. 13.) An idiot, aged 36, blind for half a year on both eyes from cataract, was successfully operated upon by reclination, since narcosis was not admissible, on account of a severe valvular disease of the heart and extraction was impossible on account of the unruly behavior of the patient, and discission was dangerous at that age. The lens, however, proved not sufficiently hard during the operation, so that the needle, introduced through the sclera, 4 mm. from the sclero-corneal junction, somewhat below the horizontal meridian, cut a sector of about one-fifth of the lens inward and upward, instead of reclining it. Uncomplicated recovery under atropine and bandage. After three months the sector fell into the anterior chamber as the lens grew smaller on the side, so that the patient gained good vision, sufficient to walk about.

On the Methods of Examination of the Pupils.

SCHIRMER, OTTO, PROF., Greifswald. (*Deutsche Med. Woch.*, 1902, No. 13.) An exact examination of the pupils to ascertain whether one or both pupils deviate from their normal width or their physiological reaction to light, on convergence and accommodation. The reflex path of the pupils runs, as S. surmises, probably from the parareticular (amacrine) cells of the inner strata of the retina, through the pupillary fibers (v. Gudden, Bechterew, Key and Retzius) to the nucleus of the sphincter, i. e., the small-celled, bilateral medial nucleus (Bernheimer) in the most anterior section of the oculomotor mucleus below the aqueduct of Sylvius, from which uncrossed fibers proceed through the oculomotor nerve to the ciliary ganglion and sphincter iridis. As shown by Bernheimer, the pupillary fibers cross in the chiasm and from the corpus geniculatum externum proceed in a double arc to the nuclei of the sphincters. Each nucleus receives pupillary fibers from each eye and both have a central connection. Thus direct and consensual reaction are

equally direct, since, on illumination of one eye, on account of the semi-decussation in the chiasm, always both nuclei of the sphincters are stimulated. S. found the physiological law that the width of the pupil of a maximally adapted eye is the same at an illumination from 100 to 1100 meter candles, as obtainable, i. e., near a well illuminated window. The measurements of the pupils must start from this physiological width at maximal adaptation in day light. At first S. ascertains, with the pupillometer of Haab, whether the pupils are equal or not. (A difference of one-fourth mm. may easily be recognized.). After adaptation of three minutes the pupil of one eye, the other being bandaged, for distance is measured and vice versa. The reflex irritability is ascertained by covering both eyes with the hands and then observing the direct reaction of the one, then the other pupil, after rapid removal of the hands, and again the reaction of one eye while the other is open, finally the consensual reaction. If abnormal, the pupillary reaction on convergence and accommodation is measured. Disturbance of the centrifugal fibers of one side exists, if, on illumination of both eyes, the pupils are unequal, and if one pupil reacts to light more sluggishly than the other, either directly or consensually. A lesion of the centripetal fibers of one side is present if an abnormally slight reaction of both pupils to light is elicited from one eye, while, on illumination of the other eye, both pupils respond normally to light, and the physiological pupillary width of this side is abnormally large. If both eyes are open, their pupils are generally equally wide. A pupillary size above 4 mm. and below 2 mm. is abnormal. S. advocates the term reflex deafness of the eye whose centripetal fibers are damaged.

Myasthenia and Ophthalmoplegia.

GOWERS, SIR W. R., M. D., London. *(D. Med. Woch.*, 1902, Nos. 16 and 17.) Gowers reports cases which contribute to the not yet sufficiently elucidated doctrine of myasthenia. They all show (1) weakness of the limbs, moderate fatigue of the muscles supplying the bulbus, ptosis and weakness of the remaining ocular muscles and of many supplied by the seventh nerve, especially the zygomatic muscles; (2) anterior ophthalmoplegia. This affection re-

mained, unaltered, as long as the patients were under Gowers' observation—in two, even until death by intercurrent disease; in the others, up to date, i. e., for a period of three years.

On the Apparatus of Weber-Wingen to Test the Illumination.

COHN, PROF. H., Breslau. (*D. Med. Woch.*, 1902, No. 19.) The new apparatus of Wingen is built on the principle of Weber's photometer, although it is not a photometer, but only indicates within a few minutes whether the illumination is below or above 50 meter candles. Cohn recommends it warmly for schools, as it is very practical and costs only $5.00. It is made by Tiesen, 32 Schniedebruecke, Breslau. (See our abstract in April ANNALS, p. 325.)

Four Cases of Disease of the Central Retinal Artery.

HAITZ, DR. E., Heilbronn. (*Beitr., zur Aug.* Heft. 50.) Three cases presented the aspect of embolism of the central retinal artery. One was due to embolism in a patient affected with mitral insufficiency, while in the second the ophthalmoscopic condition did not enable one to determine whether it was embolism or obstruction by arteriosclerosis; the third showed characteristic endarteritic obstruction. In all, the seat of obstruction could be seen. In the case of embolism recovery, with full vision, took place after puncture of the cornea and massage. Haitz observed the different transformations in the shape of the originally ovoid white embolus. With regard to recovery of sight, Haitz remarks that, even in embolism, under favorable circumstances, a sufficient circulation may be re-established so soon that the function of the retina remains intact. In connection with the first case, H. discusses in detail the mechanical relations between embolism and bloodvessels. The fourth is a case of ocular migraine, with partial atrophy of the optic nerve, and a circumscribed opacity of the retina above the macula. H. assumes, as the cause of the latter, a transient obstruction of the upper retinal artery by thrombosis after a severe paroxysm.

Secondary Atrophy of the Optic Nerve, Following Disease of the Macula.

HAAB, PROF. O., Zürich. (Ibidem.) H. observed, for

years, secondary ascending atrophy of the macular fibers of the optic nerve in certain affections of the macula, appearing as atrophic discoloration of the temporal quadrant of the optic disc. It is most marked in congenital affections, coloboma, which, in H.'s opinion, are due to intrauterine or infantile chorioiditis. Traumatic affections of the macula contribute the largest contingent. But the atrophy occurs only if the retinal elements of the anterior retinal layer, the ganglion cells, are damaged, i. e., the third neuron of the retina. In accordance with this, traumatic holes at the macula—which generally have the size of one-half diameter of disc (0.7 mm.) and thus occupy only the central portion of the central fovea (2 mm.), where the ganglion cells are almost lacking — are, as a rule, not followed by secondary atrophy. H. is very much inclined to consider the genuine atrophy of the optic nerve in locomotor ataxia and in intoxication amblyopia as secondary to affection of the third neuron of the papillo-macular area of the retina (ganglion cells and their processes), i. e., the disease of the axis cylinders of the optic nerve is secondary, and the primary affection involves the cell body, that part of the neuron most important for nutrition. For illustration, the author reports a number of cases. The admirable ability of H. to write in a clear and convincing manner is also wonderfully displayed in the essay, the study of which we urgently recommend to our readers.

Action of Iodoform in the Interior of the Eyeball.

HAAB, PROF. O., Zürich. (*Corr. Blatt. f. Schweizer Aerzte*, 1902, No. 8.) H. observed, without doubt, subsidence of iris tubercles after introduction of sterilized iodoform into the anterior chamber. This favorable action of iodoform lasted until it was absorbed in a few weeks. Then a new eruption developed. Vision was not impaired in two cases under such treatment during four and a half months. H. also saw very favorable results from introduction of iodoform into the vitreous, in threatening or active traumatic inflammations. It is borne very well by the vitreous. Iodoform, of course, does not heal all intraocular infections, but many of those which have not spread too far or have not injured the tissues of the eye too much.

A New Operation for Keratoconus.

HIRSCHBERG, J., Berlin. (*Berl. Kl. Woch.*, 1902, No. 20.) H. cauterizes the apex with his olive-shaped burner, heated in an alcohol lamp, to dark red. The remaining scar is, later, tattooed with India ink. In some cases this is not sufficient, and H. cauterizes, in physostigmin-miosis, a ring of the cornea surrounding the pupillary area, with subsequent tattooing. He reports a few cases which were greatly benefited by this method.

The Results of Crede's Method.

RUNGE, DR. ERNST, Goettingen. (*Berl. Kl. W.*, 1902, No. 20.) Out of 1917 new-born treated according to Credé's method at the gynecological clinic at Goettingen, not one primary infection occurred and only three cases of secondary infection in the second week, which could not be charged to the method. Since, from 1897 on, 1 per cent. solutions of nitrate of silver are employed, irritations of the conjunctiva occur less frequently. It is essential that Credé's prescriptions be strictly adhered to, i. e., that the instillations be done as early as possible—one hour after delivery, at the latest.

Line-Measure for Ascertaining Poor Print.

COHN, H., Breslau. (*Berl. Kl. W.*, 1902, No. 20.) Consists of a carton with an open square of 1 cm., a scale of half mm. and letters of correct size printed on the margin.

On the Tube-Shaped Visual Field in Hysteria.

GREEFF, PROF. R., Berlin. (*Berl. Kl. W.*, 1902, No. 21.) G. reports the clinical history of a hysteric child, which showed a tube-shaped ("roehnrenfoermiges") visual field very markedly. The characteristics are that the visual field has the same absolute size, measured on the perimeter, also in 1 m. or 5 m., i. e., at any distance (which is a physical impossibility), and is, according to G., very important for ascertaining the diagnosis "hysteria."

Have the More Recent Prophylactic Suggestions Reduced the Number of the Blind?

COHN, PROF. H., Breslau. (*Wiener Med. Woch.*, 1902, No. 32.) In this paper, read before the Tenth Congress

of Teachers of the Blind, C. gives a review of the causes of blindness, with statistics, in tabular form, and instructions how 44 per cent. of blindness can be prevented.

On Protargol in Blenorrhea Neonatorum.

LEWITT, DR. M., Berlin. (*D Med. Woch.*, 1902, No. 24.) A collective abstract of the literature on Protargol, with the resumé: 20 per cent. solutions of protargol have, as prophylactic against blenorrhea, certain advantages, since they have the same therapeutic effect and are less irritating.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

BY

E. E. Blaauw, M. D.,

BUFFALO, N. Y.

(Quarter ending June 30, 1902.)

TRANSACTIONS OF THE TWENTIETH MEETING OF THE NETHERLANDS OPHTHALMIC SOCIETY AT UTRECHT, DECEMBER 15, 1901. THIRTY-FIVE MEMBERS AND TWO GUESTS; PRESIDED BY PROFESSOR KOSTER.

The Ophthalmoscope After a Half Century.

Snellen, Sr., Prof. B. *(An address given by invitation.)* Helmholtz seemed to appreciate the most important fact that the light images of observed objects could be seen on the retina. So that the (not then generally accepted) theory that all optical laws fit the eye was demonstrated ad oculos. He found that the condition for reflection was most favorable when a fourfold glass was used at angle of 65° to the light. At the same time the reflected image on the cornea became much weaker through polarization. For correcting errors of refraction a lens was placed behind the reflecting plates.

In the second model made by Rekoss a double disc containing lenses that could be used separately or in combination was attached.

The ophthalmoscope of Donders, made by Epkens, was made to facilitate drawing a likeness of what was seen. It is composed of a horizontal tube containing a plain mirror and a convex lens. It could be adjusted as to height. 49 years ago Van Tright used this instrument for making the pictures for his well known dissertation "De Speculo Oculi."

The opthalmoscope of Liebreich on an upright staff was made to assist in drawing the inverted image. A concave mirror is at one end of the tube and at the other end is a

movable lens attached to it is a support for forhead and chin and a movable shield. Liebreich used it in making the drawings for his celebrated atlas.

Pemphigus Conjunctivæ.

Bouvin, Dr., was consulted by a man 49 years old who's trouble began four years ago with blebs on right side of tongue. Later blebs appeared on different parts of body. These ruptured, dryed up and disappeared in about ten days to reappear six weeks later. Six months ago patient had photophobia, swelling of lids, and much muco-purulent discharge. On entering the hospital he had lesions of different parts of his body where the skin had disappeared down to the corium leaving an angry red or bluish appearance, about the size of a dollar. The upper eyelids were thickened especially that part corresponding to the tarsus. There was slight entropion of the right lower lid but no swelling. The conjunctiva was greatly shriveled and a symblepharon appeared at the outer corners. The conjunctiva of right upper lid presents defect one and a half centimeters long with raised margins while that of left eye only a small part is denuded of conjunctiva. The corneæ are clear. V.O.D.=6/8. V.O.S.=4/6.

Dr. Van Rynberk presents a patient with the same disease. His chief complaint was pain and photophobia accompanied by intense conjunctival and pericorneal injection. Lacrimation was not excessive, while the palpebral slit was greatly narrowed on account of symblepharon. There was a slight secretion of very tenacious mucous, media and fundus seem normal. Cornea slightly opaque. Vision 5/20, not improved with lenses. The bulbi movable in all directions but excursions limited. Superficial layers of cornea nearly entirely disappeared. (Fluorescin test). The course of disease was intermittently good and bad.

Patient had been healthy up till July 5, when he was attacked with a high fever together with an eruption which manifested itself chiefly on the face, hands and feet, while the mucous membrane of the mouth, throat and eyes became red and painful. Affected parts of the skin became red, while different sized blebs appeared and disappeared spontaneously. Fever lasted ten days but blebs did not disappear until after four weeks. The eyes alone remained

sore. The acute condition has gradually assumed chronic character. Examination of the conjunctival secretion revealed the presence only of xerosis bacilli, streptococci and sarcina together with leucocytes in fine fibrin stratum and epithelial cells from cornea and conjunctiva. The therapy was powerless to stop the process.

The Operative Treatment of Strabismus.

KOSTER, PROF. W., divides his subject into two parts; I. tenotomy and II. muscle shortening. In tenotomy he follows the method of Arlt with a horizontal meridianal incision in the conjunctiva. With forceps he grasps the tendon until the lateral incisions in Tenons capsule are made. The strabismus hook is then introduced to ascertain if the capsule opening is large enough for the desired effect and to make sure that no adhesions exist between the tendon and bulb. With Prof. Snellen he agrees that the operative effect can be regulated by the extent of the lateral incisions. Ordinarily the effect of tenotomy (in the presence of a good functioning antagonist) does not exceed 15°, very often less. By the following method K. often gets an effect equal to 25°. The lateral incisions in Tenons capsule are not made perpendicular to the direction of the muscle but V-shaped at an angle of 45° with the opening backward. The anterior part of the capsule is then taken on the hook and incised obliquely forward so opening will gap widely as possible. This allows of a greater contraction of the tenotomised muscle which will reunite further back by its connection with Tenon's capsule. During last five years 200 cases had been treated. In children of less than five years the incision is not made so extensive as a slight amount of strabismus is not undesirable at first. The subsequent effect will be greater. K. emphasizes that the effect of tenotomy can be limited and that high degrees of strabismus can be corrected with it.

II. Muscle shortening. The history of "Vorlagerung" was one of suffering until emphasis was laid upon the necessity of firm union between the tendon and the sclera, although Von Graefe found this "nicht ohne Bedenken." In 1869 S. H. Halbertsma mentions, Snellen was in the habit of leaving a stump of the tendon on the bulb to which he afterward attached the shortened muscle. This method was abandoned for a time, but has recently again been ad-

vanced by Schweiger and is quite generally approved.

K. advises the following method. A meridianal incision is made in the conjunctiva over the middle of the tendon after which a small opening is cut in Tenon's capsule at side of tendon. A hook is pushed under the tendon and a counter opening is made on other side in the capsule. The capsule is then cut for a distance of about 12 mm. on each side of the tendon, so that both tendon and forward part of muscle become freed from capsule. A doubled needled thread is passd from without inward through the muscle and tied so that the knot lies under and behind the muscle. They are then passed from behind forward through the tendon near its insertion to the bulb. Before tying these, tenotomy of the antagonist is performed and while the patient is directed to move the eye in the direction of the tenotomised muscle the eye is forcibly drawn over to the opposite direction and the suture tied so that the knot of this last is on the outer side of the tendon. This silk thread is left permanently. The conjunctiva is then sutured over the shortened muscle and the operation is completed. For every four degrees of squint the muscle must be shortened one millimeter.

The advantages of this method are, I. the muscle will act upon the same place on the bulb as formerly; II. operation can be quickly performed; III. a firm unelastic union takes place; IV. the cosmetic effect is very good; V. if the suture tears through the tissues nothing is lost, as the operation can be repeated very soon afterward again.

The indications for the operation are when the antagonist of a tenotomised muscle is weak as in strabismus divergence and in high degrees of strabismus convergence and when a certain amount of squint remains after a paralysis.

Injection of Air into the Anterior Chamber for Tuberculosis of the Iris and of the Cornea.

KOSTER, PROF., presented the following cases. A healthy looking lady 22 years old with hereditary tubercular taint. First sought council on November 22, 1900, for an acute iritis, which improved with rest and hot compresses but soon became worse and complicated with cyclitis. The inunction treatment had no effect. Eight weeks later while the hydrargyrum treatment was still being carried

out a number of small dense tumors appeared in the nasal quadrant of the iris. From their position, their rapid development and their yellowish color, a diagnosis of tubercle was made. An iridectomy including a part of the growth was made. The anterior chamber of a rabbit's eye was inoculated with this, but with negative results. The tubercle kept on growing so that the eye was considered lost. At this stage K. introduced into the anterior chamber a Pravaz syringe half filled with sterilized air. Drawing off the aqueous he filled the chamber with the sterilized air without removing the canula. The effect was very beneficial and the air absorbed quite rapidly. This procedure was repeated three times, after which the eye appeared cured. During the next few weeks the inflammatory exudate had absorbed and the media cleared leaving the patient a vision of 6/18. After the correction of the wound astigmatism patient had vision of 6/12.

The second patient was a 17 year old girl of cachectic appearance who had suffered with her eyes for the last five months. The nasal inferior part of the left anterior chamber was half filled with a yellowish grey tumor. Besides this a few small tumors could be seen in the edge of the iris. A diagnosis of tuberculosis was made, not forgetting that there was a possibility of leuco-sarcoma or of gumma. For six weeks anti-specific treatment was faithfully carried out, in spite of which the tumor gradually increased in size to such an extent that enucleation was considered advisable. Air was injected into the anterior chamber at six different times, though opacity of the cornea made this very difficult and a discission was necessary to make an opening through which the canula of the syringe was introduced and the air injected. The tuberculous process became quiet, the tumor decreased in size; at this time absorption of exudate was nearly complete and anterior synechiæ could be seen which prevented the formation of the anterior chamber. The iris is entirely atrophic and the cornea is beginning to clear.

The third case was that of an 18 year old boy who had once been treated for a parenchymatous keratitis and irido-cyclitis of right eye. The appearance, however, was different. Circumscribed yellowish foci could be seen in the cornea and some miliary tubercles in the ocular con-

junctiva above the cornea. These were removed with a piece of the conjunctiva. The inunction treatment was without effect. Iodoform salve could not be endured, as it irritated the eye too much. Four injections of air were made after which the eye began to improve. At the present time the cornea is entirely clear and transparent.

K. advises that the injection of sterilized air be tried in all cases of tuberculosis of the cornea, iris and chorioid. They should be repeated sufficiently often.

Retinitis Pigmentosa in Deaf Mutes.

MULDER, PROF. In 1881, examined pupils of deafmute school at Groningen and again last year. Pupils are not accepted until 7 years old and are discharged at 18, so at this last examination an entire new set of pupils were present. In 1881 there were 216 and in 1901, 167; making a total of 383. Of these 11 showed typical signs of retinitis pigmentosa; viz., hemeralopia, concentric narrowing of the field, more or less atrophic disc, and more or less pigment in the retina. In the first 216 cases it was present in 4, making nearly 2 per cent. and in the 167 it was found in 7 cases or a little more than 7 per cent., which is less than Liebreich found in 1861. The possibility of a wrong diagnosis by Liebreich in some cases is mentioned on account of the frequency of changes in the chorioid which take place in deaf mutes as chorio-retinitis or an old chorioiditis. These changes are probably due to hereditary syphilis which M. found in 4 cases. Two of these had had good hearing up to the 6th and two up to the 7th year, when deafness appeared concomitant with keratitis parenchymatosa. Consanguinity of parents was absent and not one was of Jewish descent, although 20 per cent. of the inmates were Israelites. In Paris Hocquard found 5 cases in 200 deaf mutes, of which three were the products of consanguinal marriages. Badal of Bordeaux found 7 among 200 deaf mute girls, of whom 3 were the result of consanguinal marriages. There is no doubt but that many cases of retinitis pigmentosa occur in deaf mutes and that consanguinity is present in about as many cases as retinitis pigmentosa alone. As consanguinity is present only in a certain per cent. of these cases, it cannot be the true cause. M. advances the following hypothesis, that hardness of hearing, deaf-mutism, retinitis pigmentosa and idiocy are all

symptoms of one and the same disease, which is located in the central nervous system. And as the retina is only an extension of the brain tissue forward it is also found in it. Each one of these symptoms may exist throughout life or two or more may be present simultaneously. Thus we may have partial or total deafness with or without retinitis pigmentosa. Consanguinity then favors the primary cause from which these conditions arises.

In the discussion Dr. Blok reported that for five years he has been treating a brother and sister who had descended from otherwise healthy parents with no history of consanguinity. Both have an idiotic expression on their faces and are hard of hearing and suffer from pseudo-muscular atrophy as well as from retinitis pigmentosa. He believes as has been claimed, a combination of brain and nervous diseases with retinitis pigmentosa is not uncommon.

The Pocket Optotypes of Landolt.

SCHOUTS, DR. G. J., defines a pocket optotype as one that can be carried with the least inconvenience. Those of Landolt are too heavy and large. The benefit of being able to move the rings in different directions is lost as soon as more than one are placed on a card as in L's second card which contains 7 rings. In order to determine the accuracy of vision it is necessary that the size of the retinal image be not larger than .225 mm. (Dr. Laan). In Landolt's largest optotype the size of the retinal image is considerably greater than this as soon as the distance of observation is less than 5 M. In practice the results obtained by counting the fingers is as satisfactory as that of Landolt's largest optotype.

S. uses two small cards with a diameter 6.5 mm. having one ring on each side. The external margin of the rings have a diameter of 44, 22, 11, and 5.5 mm. The breaks in the rings are 7, 2; 3, 6; 1.8 and 0.9 mm. square, the same as the thickness of the rings. They are carried in an envelope and weigh 6.5 grams. The largest has an opening that can be seen at a distance of 24 m. with an angle of 1 minute. The second is for a distance of 12 m., the third for 6 m., and the fourth for 3 m. In small appartments the mirror method of Pflüger can be used.

S. made a comparative examination of 200 patients as

they presented themselves at the polyclinic with Snellen's type and Landolt's optotype. Of 41 emmetropes the same results were obtained by both methods in 26, 10 gave somewhat better vision with Snellen's type and 5 gave reverse results. Of the 132 hyperopes 95 gave the same result in both methods, 22 read better with Snellen's type and 16 recognized the rings better, while three gave very marked differences. One Sn. 6/6 and L. 4/6; the second Sn. 6/12 and L. 2.5/12 and the third Sn. 6/12 and L. 5/6. In 25 myopic eyes the results were similar in 14; 2 could read the letters better while 9 had better vision with the rings.

Distance of observation had some influence, as myopes had better vision for short distances and hyperopes had better vision for longer distances.

In 27 cases of hyperopic astigmatism, 14 gave the same results in both methods, 2 could see the letters better and 2 the rings, while the remaining 9 could not be compared. In 5 cases of myopic astigmatism, there was no difference in 3, one saw the letters better and one the rings. In one case of mixed astigmatism there is no difference in either method.

In the 9 cases of hyperopic astigmatism above mentioned there was a marked difference in vision in each individual case, depending on the direction of the axis of the opening of the ring. Eight times the vision was best when the opening coincided with the meridian of weakest refraction, which means that the eye was focused for the meridian of greatest refraction. The difference of vision in the two positions of the ring was nearly 100 per cent. This agrees with Visser's opinion that the astigmatic accommodates for the easiest focused meridian. The ninth case showed the reverse, without any apparent reason. That this symptom is due to astigmatism is proved by cylinder lenses, which caused it to disappear. Still, there may be another cause that the opening of the rings could not always be seen equally in all directions, viz., the comparative inequality of acuteness of vision of the superior quadrant of the fovea centralis as compared with that of that of the other parts.

Regulations for the Examination of Military Men.

Blok, Dr. G. J., examined 150 eyes of persons under 20 years of age and 120 eyes of persons between 20 and 35

years of age, and compared the results with that of his own vision after making himself myopic for different degrees. All had normal vision after correction of refraction. He found that the limit value of vision for different conditions was as follows:

For myopia of 0.25.....	$^5/_6$.	
" " " 0.5	$^1/_2$.	
" " " 0.75.....	$^1/_3$.	Irrespective of the age of
" " " 1.	$^1/_4$.	the person.
" " " 1.25.....	$^1/_5$.	
" " " 1.5	$^1/_6$.	

With the exception of non-progressive myopes of 1 D. in persons under and of 1.5 D in persons above 20 years, the visual value of the astigmatic and the myope is practically the same. The astigmatic can learn to fire at a target just as well as the myope. For these reasons, the myope should not be preferred above the astigmatic, as at present. It is also unjust to make the same visual demands of those having a macula cornea, etc., as of the astigmatic. In the presence of a strong light the sight of those suffering with macula is much poorer, while that of the astigmatic is much better, on account of the narrowed pupil. Revision of the regulations is, therefore, much desired.

Endarteritis of the Arteria Centralis Retinæ.

De Vries, Dr. W. M., presented microscopic slides of the eye of a patient with the following history: In August, 1898, a lady 77 years old had vision $^1/_2$ with +2 D. On April 28, 1900, she returned, complaining of a very great pain in the eye during the past 17 days, with vision very much diminished. For the past year the vision had been poor, with intermittent periods of improvement. An acute glaucoma was present, though the pupil was not dilated on account of multiple posterior synechiæ. Vision=0. Treatment was unsuccessful, so enucleation was performed two months after the first glaucomatous attack. Many hemorrhages were found in the retina. The small arteries and veins showed signs of endarteritis and endophlebitis, with a very marked narrowing of the lumen. Beneath the endothelium of the large arteries on the disc there were found large cells with granulated protoplasm and

nuclei, that were not always stained equally strong, in the place of the fine fibrillary tissue, with few oval nuclei as in the small vessels. The entire space between the intima and the media is occupied by these cells, while here and there crystals of fatty acids and chosterine could be detected. The trunk of the vein in the disc has only a very small lumen, while the surrounding tissue is infiltrated with leucocytes.

This is a case of retinitis hemorrhagica, or so-called thrombosis venæ centralis, with secondary glaucoma, as described by Stölting, Wagenmann, Bankwitz, Reimar and others. Endarteritis of the arteria centralis retinæ and its branches will sometimes cause retinitis hemorrhagica and sometimes the clinical picture of embolism of the central artery.

Some Improvements in the Stereoscopic Field.

DUURING, DR. G. P., arrives at the following conclusions:

I. The distance from center to center of the photographic objectives, as well as of the eye-piece, must be equal to the interpupillary distance.

II. The focal strength of both objective and eye-piece must be equal.

III. The distance of the photograph from the eye piece must be equal to the focal strength of the lens.

IV. Each stereoscopic half must occupy such a position that the corresponding imaginal points of a distant object shall have the same mutual relation to each other for distance as the inter-lenticular and inter-pupilary distance.

V. The objective and eye piece should be one lens, so that the faults made by the objective, e. g., distortion of image, will be neutralized by the eye piece, i. e., when the rays are reversed an orthoscopic image will result.

Discussion. Dr. Nicolai expressed the opinion that the theories advanced are not new, as Helmholtz in the second edition of his work has fully described the requirements of a good stereoscope and also gave the reasons why it was preferable in many cases to make the relative distances between the stereoscopic figures greater than the interpupillary distance.

Prof. Snellen, Jr., stated that the usual stereoscope is based on a simple prismatic effect to be obtained. A sphere

and prism combined give a still clearer image than a decentered sphere. If the inter-lenticular distance is greater than the inter-pupilary space, the image will appear smaller and near by, but if the stereoscopic lenses are stronger than the reduction disappears while the impression of nearness remains.

Ophthalmic Tonometry.

LEEUWEN'S, J. J. S., doctorate thesis under the supervision of Prof. Snellen, Jr. The writer mentions the physiological, pathological and artificial causes that influence intra-ocular tension and covers the ground of our present knowledge of this subject. He divides tonometers into two groups. I. Those based on the principle that the hydrostatic pressure existing within an elastic membrane can be measured by the amount of resistance met with in indenting the outside surface with a point. II. Those that measure the force necessary to flatten a certain part of the bulb. The best tonometer is that of Koster. (Arch. f. Ophtal., 1895.) The writer found that it was difficult to ascertain when the plate and the margin of the cylinder are exactly in a plane and advised the following change. It must be placed vertically on the eye and as the weight is greater than the force ordinarily used, he hangs the instrument on a fine elastic thread, so that the cylinder just touches the eye. Even then the spring was insufficient. He concluded that no accurate trustworthy determination of the intra-ocular tension can be made, because the pressure exerted by the extrinsic muscles and the difference in resiliency of the ocular coats varies in different persons and under different conditions.

The tonometer is useful only when the examinations are compared with the results obtained at a previous time in the same patient and when the point on the bulb is always the same. To determine the interocular tension with exactness, L. followed v. Schulten. (Arch. f. Ophtal., 1884.) He brought the capillary manometer in contact with the aqueous in a rabbit's eye and waited till the fluid became stabile, viz., when the compressed air was in balance with the intra-ocular pressure.

The tension increased by the action of the orbicularis and the retractor bulbi and even the third eyelid.

The intra-ocular tension increased or decreased with the

rise and fall of the blood pressure. Compression of the carotid on the same side decreased the intra-ocular tension about 10 mm. Hg. The same is true after irritation of the Vagus. Immediately post mortem the intra-ocular tension varied from 4 to 10 mm. of mercury. Occasionally atropine caused a slight lowering of tension. It also retarded the restoration of the intra-ocular tension, which in a normal eye takes about 15 minutes after the aqueous has been removed.

Vision and its Determination. (Dedicated to Prof. H. Snellen, Sr.)

LAAN, DR. H. A., maintains that form-sensation must be the rational basis of visual acuity. The influence of the accommodation on the size of the retinal image is known, the difference in refraction need not prevent us from ascertaining the size of the retinal angle. The narrowing of the pupil lessens the obnoxious influence of the dispersion circles but does not entirely prevent it. Other irregularities in ocular structure are of no importance in the formation of the retinal image. At the present time it has not been demonstrated that any difference in the size and location of individual rods and cones at the macula have any special influence. For determining acuity of vision we must consider the smallest perceptible retinal image the so called physiologic point or the smallest distinguishable distance between two points (the Empfindungskreis of Weber). For Laan the value of the physiologic point is about 20″ (for Aubert and Groenouw about 35″ and for Guillery 50″) and as the superficies of a single cone is 60″ it demonstrates that the irritation of a single cone can reach the cortex without the help of the surrounding elements. The size of the Empfindungskreis (circle of sensibility) was found by Aubert to be 60″, which has later been confirmed by Groenouw, Guillery and Laan. Theoretically therefore it would be rational to examine acuity of vision by means of two black points whose distance from each other is equal to their diameter. This however was impractical so that test objects were constructed composed of double lines (series of physiological points). If vision is to be considered as a function of the form sense, as Vierordt acknowledged, then it must be expressed in linear measure. Then the principle of the

double line must be present in every test. This has often been neglected in the optotype. Even Snellen's letters are insufficient for exact measurements as there is too much chance for guessing. The three lined hooks with the middle line as long as both outer ones is a better test. If the retinal angle varies between 60″ and 48″ then such an image covers five rows of cones. Snellen published his formula V. = d/D. supposing that the perception of large objects is in every way similar to that of small ones. This has been questioned as in large objects the irritation of the peripheral cones would be less value than the central of ones making it appear too large. Laan endeavored to ascertain how far the perception of large objects could be used in the determination of vision and for what sized objects the formula V. = d/D would hold true. The influence of the retinal image must be isolated from that of the ocular movements which cannot be done in the usual sight. The best test for this purpose is the usual "E" (three lined hook) which can be turned in any position desired. This is necessary because the fovea is a flattened oval. In observing a letter it is not possible to see all the parts with equal distinctness simultaneously. The object must be illuminated just long enough for easy recognition and not long enough to permit of ocular movements. The time necessary for this depends on the degrees of illumination, on the size of the object and the adaptation of the eye. Believing that a 1/4 of a second would be long enough to recognize the object and yet prevent ocular movements, that period of time was chosen. To assist him in these tests and to make them perfect Laan used an instrument of his own invention called the tachistoscope by means of which he could grade the time of exposure from 2/3 up to 1/200 of second. In these tests L. used his right emmetropical normal eye (he is 33 years old). The diaphragm through which the observations were made has a diameter of 1.75 mm. and the distance from the test type was 5 m. L's first experiments were made to ascertain the influence of ocular movements on the perception of the object. He found that the smallest "E" (2′ 30″) could be seen just as easily as the largest ones (8°) with or without ocular movements. He demonstrates that the most perfect test was made with a relatively weak illumination

when the contrast between the test type and background would be least, but of course a limit was reached below which the perception of the smallest objects became much more difficult than that of the larger type. Therefore we may exclude ocular movements and place a greater value upon the size of the pupil and time of exposure. Although retinal perception took place under very unfavorable circumstances no ocular movements were observed when the test types were from 113′ to 190′. The following is strong evidence that in the ordinary perception of objects the movement of the fixationpoint is not taken into consideration. L. required 1/43 second for recognizing in its entirety an object of 110′ while 1/3 of a second was needed for recognizing a part of it. By placing the E in different positions it could be demonstrated that the foveal field did not extend equally far in all directions. In regard to the size of the fovea centralis itself, L. concludes that the fovea is only partly responsible for motionless vision and that Snellen is right in his supposition that even the largest test types are perceived by the quiet eye. The next question is with regard to the equivalency of the foveal rods. He determines the field for maximum vision to be about 8 cm. (55′) in the horizontal and about 4.5 cm. (31′) in the vertical meridian. The acuity of vision diminishes regularly toward the periphery, so that the vision of the foveal margin is only one-half that of the center. Comparing Shellen's types with these values we can accept the equivalency of the elements of this territory used for the largest letters. This is not true for larger objects, as Snellen himself agrees. To use the formula V. = d / D for vision smaller than 1 / 60 more simple objects could be used as the E without the middle line, yet experiments did not show any special advantage.

Experimenting with increasing and diminishing illumination he found that the time required for recognizing an object depended on its size and the time of exposure. Small objects should therefore be recognized if the illumination increases sufficiently. The limit is reached when the size of the object is smaller than the area of a single cone. L. found the size of the cone to be equal to 60″. At the same time he ascertained that the size of the Empfindungskreis corresponded with the conical area.

In order to ascertain the influence of the rods on the perception of objects a weak illumination was used. At a certain stage the central perception failed. In diminishing the illumination to about 1/2 M. C. an apparent struggle for the supremacy between the rods and cones takes place. It soon became demonstrated that pericentrally a smaller object could be recognized than centrally, and the peripheral image appears much blacker than the central. If the light is very weak then only the peripheral image can be perceived. Here also it was found that the recognition of a larger image required less time than that of a smaller one. Neither are ocular movements required. A peripheral image can be recognised under a smaller angle than the smallest perceptible central one under the same illumination, but on the other hand fatigue takes place much sooner. A central defect was not observed until an illumination of 0.0074 M. K. or less was reached and corresponds in form with that of the fovea. It seems probable that not all the cones show an equal degree of sensitiveness and that the medial ones functionate before the peripheral ones do. At all events L. confirmed the opinion that the elements of the foveal periphery possess another degree of irritability than the extrafoveal ones do.

The Operative Treatment of Myopia.

KOSTER, PROF. W. (*Weekbl. v. Geneesk.*, July 6, 1901), mentions that Donders with all his influence opposed the removal of the lens, not because he valued the advantages of accommodation for the near sighted eye, but rather because he valued the aphakic eye less. This was during the pre-antiseptic period. Von Graefe also opposed it, fearing that even if the operation was a success, that intra-ocular hemorrhage, opacities of the vitreous, solutio retinae, and progressive chorioidal atrophy would occur more frequently. From K.'s experience he agrees with von Hippel that the refraction remains unchanged, or at most does not increase more than one diopter. He even advises the removal of the lens in cases of progressive myopia with fair chances of useful vision. He advises operation in most cases where the wearing of spectacles is difficult on account of the nature of the patient's occupation and where there is a considerable degree of anisometropia, especially when accompanied by strabismus or when one eye is em-

metropic and the other myopic. In Holland K. does not often meet with cases that require operation on both eyes. He advises the double operation only when ocular movement is good in each eye, when the amount of myopia is nearly equal for both eyes and when monocular vision is insufficient and binocular vision an absolute necessity to the patient. In Holland high degree myopes as a rule possess poorly moving bulbi and harmonious co-operation can hardly be expected after operation. In Germany the myopic eye of more than 12 D. is not so bulging and restrained in its movements. K. did not find those opacities in the anterior part of the vitreous as described by Hertel. K. thinks that the apparent accommodation present after operation is due to the relatively small opening through which the retinal images are projected, which opening being the result of the secondary operation, as a rule has a diameter of 3 to 4 mm. The pupil also is much smaller after operation. Although the danger may be greater yet for patients over thirty he prefers the extraction of the lens according to the Hess-Sattler method.

Influence of Age and Refraction on the Size of the Pupil.

STRAUB, PROF. (*Weekbl. v. Geneesk.*, July 20, 1901), communicates to the Biological Section of the Natural Science Society of Amsterdam the results of the investigations of Dr. R. Tange. The physiological pupillary width was measured after adaptation to a light from a 600 to 1000 meter candles and comparing them with the openings of the filiere of Chariere. 1000 measurements were taken and arranged according to the refraction of the eyes. The pupillary width decreases with age. In persons of the same age the strongest hyperopes (+ 4 and higher) had the smallest pupils. Next in order came the weaker hyperopes then the emmetropes and last of all came the myopes. Above the age of twenty no difference exists in the size of pupils in myopes and emmetropes.

The pupilary width was also determined after adaptation to a light of from 50 to 100 M. C. The pupils of all ages and all conditions of refraction were larger than the physiological pupil width. Under the age of fifty the pupils of myopes were larger than of emmetropes. S. attributes the variations to differences in tonus in the Musc.

sphincter pupil, as it is in remote connection with the muscle of accommodation.

Dangerous Effects on the Retina of Therepeutic Doses of Beta Napthol.

Van Der Hoeve, J., Dr., as assistant of Prof. Koster, reports the following case.

Patient is a florist, 40 years old, has for the last half year complained of diminishing vision in the right eye. Vision of the left eye was poor on account of a burn at the age of 8. V. O. D. = 4/60 with — 1.5 D. = 8/60. V. O. S. 8/36 with + 1.5 D. No astigmatism. The lenses in both eyes were cataractous, the opacities being situated chiefly in the posterior cortex. Fundi indistinct, retinae with a marbled appearance. No sugar or albumen in urine. Half a year ago patient had a facial rash for which he was treated with a salve. At the same time a slight irritation accompanied by lacrimation was noticed in both eyes, since which vision gradually became poorer. At this time Prof. Koster for the first time suspected the use of napthol salve and that it probably was the cause of the cataracts. The family physician reported that the patient had used a 3 per cent. b. napthol salve in yellow vaseline for two weeks on face and neck and then the treatment was ordered discontinued on account of ocular irritation.

Bouchard, Sharrin and Kolinkski experimented on animals with napthol with negative results. V. D. H. in experimenting on animals found changes in the retina and lens after the exhibition of small quantities, whether as a salve or injected subcutaneously or given per month or applied to the conjunctiva.

The second patient was a 11 year old boy, who had used a 10 per cent. salve of b. napthol for an exanthem of the scalp. 10 days after beginning the treatment a white point was noticed under the macula of the left eye. Five days later the temporal part of the retina of the right eye showed some greyish white foci and the luster of the retina was slightly disturbed so that some vessels could not be followed for some distance from the disc. No changes were found in the lenses. The treatment with Napthol was discontinued. Within five days the opacities in the retina had disappeared. The foci in the right retina have

changed but little and in one place it has been replaced by pigment.

The next case reported is that of a lady, 21 years old, who had used a 1 per cent. salve on the scalp for two weeks. Her sight had always been good. V. O. S. = 6/8, myopic 1 D. V. O. D. 6/12, emmetropic. No astigmatism. Both retinæ are slightly opaque and have a milky appearance. In the posterior cortex of the right lens was found a spoke-like opacity directed downward and inward. Two weeks later this had almost entirely disappeared. At present there can be seen a glistening white spot just above the macula of the right eye.

The next patient had been receiving 4 grams of benzo-napthol daily for some time. Her sight had always been good for distance, but not for reading. She is 28 years old. V. O. S. = 6/6. V. O. D. = 6/8. No astigmatism. Both retinæ have a milky opaque appearance and the disc is somewhat hyperemic. Hundreds of yellowish white spots are found in the fundus with here and there darker colored streaks. The administration of b. napthol was discontinued. The similarity in the effects of naphthaline and naphtol might be explained on the ground that frequently small quantities of a. and b. naphthol are present in naphthaline. The naphthols are more soluble and more easily assimilated. In the digestive tract benzo-naphtol splits up into benzoic acid and naphthol. The appearance of retinitis must be considered as a counter indication to the use of naphthol. In the experiments on animals there were also found changes in the uvea and irregular refraction of the lens.

Normal Winking.

LANS, DR. L. J., (*Weekbl. v. Geneesk.*, Aug. 10, 1901) found as the result of experiments that the commonly accepted theory that winking is the result of corneal desiccation cannot be sustained. But that cooling of the surface is the chief cause. Light irritation is only a secondary cause. Psychic causes might increase reflex irritability, but cannot be regarded as a direct cause, except in case of fright, where it assumes the nature of a afferent reflex. The diminution of winking in infants must be explained on the ground of diminished reflex irritability, as is also

the case in somnolent and moribund persons. Stellwag's symptom in Basedow's disease is not constant, as pathological conditions are often the cause of imperfect winking (disturbance of co-ordination centre, Sattler; an irritation symptom, Möbius).

Practically there is no winking, when the eye is submerged, as the temperature is nearly constant, desiccation of the cornea is prevented and psychic causes have less force, consequently only the excitation of the eye remains.

Donders thought that winking changed the intraocular tension. Koster saw the mercury in the manometer connected with the eye make rythmical movements. However, the opinion that the rythmic fall of tension should be the cause of winking is merely a supposition.

According to Müller the eyeball moves forward 1 mm. and according to Donders 66 .mm., while Tuyl demonstrated rythmic movements simultaneous with the cardiac impulses. If cooling is prevented then the evaporation of the tears does not seem to influence winking. Normally the tears collect in the lachrimal bay and inferior lachrimal sac and their weight might induce winking.

Spontaneous winking is regulated by two reflex arcs;

(A) Trigeminous-facialis arc.

(B) Opticus-facialis arc.

Reflex exciting stimuli for arc A.

(a) Cooling of the cold points (cornea and conjunctiva.

(b) Touching of the sense-of-touch-points or pain points (cornea, conjunctiva, ocular coats externally and internally).

N. B.—Winking is almost entirely absent when the eye is submerged and when covered by a heated pair of spectacles. Winking increases when the spectacles are cooled.

Reflex exciting stimuli for arc B.

(a) Light.

(b) Sudden perception of danger, especially if near by.

N. B.—Increased intensity of these stimuli causes: regarding A., the adaptation of the temperature sense of the cornea; regarding B., the adaptation for light.

The psychic and inflammatory conditions produce a great influence on both arcs.

A Supernumerary Lacrimal Canal.

SCHOUTE, DR. S. J., was consulted by a teacher, aged 20 years, for chronic conjunctivitis. Injection with Anel's syringe resulted in a flow of fluid from an opening situated half way behind the nasal part of the canaliculus. In size it is equal to that of a No. 2 probe. If the tip of this is introduced into the opening and the syringe used in the normal punctum then the fluid escapes down into the nose and some of it through the superior punctum. This demonstrates that it does not correspond to either the superior or inferior punctum. As there has been no dacriocystitis or other trouble that could account for this condition, the diagnosis must be that mentioned above. It could be explained on the ground that two secondary epithelium knobs instead of one grew out of the primary tube.

Patient was hyperopic to the extent of one dioptre, the correction of which gave her much relief. Three cauterizations of the opening failed to close it.

Trachoma in Amsterdam.

JOSEPHUS JITTA, DR. N. M., reports the results of his examinations of the eyes of the pupils of the lower schools, which he had also examined in 1897. Van Rynberk found in a kintergarten with 500 children that 76.7 per cent. were afflicted with trachoma (1880). Jitta found the highest percentage of trachoma in children under 3 years. As previously stated he still maintains that trachoma is not contagious. He says that the condition known as trachoma is the result of uncured cases of ordinary conjunctivitis in which the character of the conjunctiva has undergone changes as the result of continuous irritation of a greater or less degree. Infants often suffer from various forms of conjunctivitis with increased secretion. The causes leading up to this are measles, weakness, poor nourishment, unsanitary and unhygienic surroundings. Jitta denies the existence of acute trachoma. The first signs of acute affections are seen in the kindergarten. He admits, however, that even after an apparent cure of several months there may appear symptoms that are similar to trachoma, yet the original affections had no specific clinical character. It often happens that several children are attacked by apparently the same disease with the

same symptoms in some of whom healing takes place kindly, while others suffer from changes in the conjunctiva, which afterward have the true trachomatous appearance.

Very few children were found having an acute conjunctivitis, but most cases appeared to be a latent variety of trachoma with no secretions and no corneal affections. Among the 210 children of the Talmud Tora school there were found in 1880, 53 per cent. trachoma. In 1897 it had decreased to 11.4, and in 1901 to 8.57 per cent. In 12 public schools composed almost entirely of Hebrew children there were in 1880, 35.5 per cent. of trachoma, in 1897, 16.7 per cent. and in 1901, 7.8 per cent. Improvement in the hygienic conditions was the principal cause in the decreased percentage.

A Case of Glaucoma Malignum.

Van der Hoeve, Dr. J., reports the following case. Miss W., aged 44, was first seen November 19, 1900, while complaining of pain in the eyes and diminished vision. Five years ago she had been examined and the records showed that vision, hyperopic, 3 D. and fundi were normal. There is slight enlargement of the heart which results in an unusual flushing with the least emotion. Her physical condition is apparently good. She looks older than she is. The present condition of the eyes is hyperopia 2 D, cornea superficially opaque, pupils large, anterior chamber shallow, anterior ciliary veins dilated, the disc markedly excavated and surrounded with a glaucomatous halo. Vision 8/24. The visual field was much narrowed, especially inward. The color sense is normal. Prognosis for vision poor. On November 23 anterior sclerotomy was performed on the right eye, resulting in tension becoming *normal*. The next day the anterior chamber was still absent and T was + 1. After six days a shallow anterior chamber was present with T normal. Tension in the left eye was all the time high in spite of the repeated instillations of pilocarpine and the eye was operated on on November 28. Nevertheless tension remained *too high* after the anterior sclerotomy. Two days later an acute attack of glaucoma appeared in the right eye and T. rose to + 2. Tension in the left eye was normal for some time though its anterior chamber was

still absent. There was prolapse of the iris in both eyes. Heurteloup on the proc. mast., eserine, laxatives and blood letting reduced tension to + 2. Yet pain continued and T. remained too high, so that on December 3, an iridectomy upward was performed. T. diminished slightly but not sufficiently. On the following day T. was + 2 and vision gradually became poorer. December 13, V. O. S. = 1/300, V. O. D. 0.1 300. Cornea opaque. Two days later the lens was removed without much difficulty and a little vitreous cut off. T. was reduced to — 3. Next day when the dressings were removed a great part of the ocular contents had escaped. This was cut off and examined microscopically and found to be vitreous and retina. The right eye was now entirely blind. T. remained normal, the cornea became glossy and transparent. V. O. S. was gradually reduced to light perception on January 11 T. = + 1, cornea opaque and many posterior synechiæ From time to time there is pain in left eye accompanied by edema of the lids and conjunctiva, at which times T is slightly higher and pupil wider. On February 18 three punctures were made with a v. Graefe cataract knife through the sclera of the anterior chamber and through the root of the iris into the posterior chamber, after which these attacks ceased for more than a month. The last glaucomatous attack occurred on April 13. Vision in both eyes is entirely gone. This is one of those rare cases of a malignant character, which become very evident after operation on the second eye. If T. does not immediately after operation fall to — 2 or — 3 then we should wait some weeks before meddling with the other eye, and use the ordinary local and general remedies indicated. To this we may add sympathotomy, sympathectomy and resection of the sup. cer. ganglion.

The Origin of the Vitreous Body.

HAEMERS, DR. ARCH., (*Weekbl. v. Geneesk*, Oct. 19, 1901), reports the results of his work to the Fifth Flemish Congress of Medical and Natural Sciences. The vitreous body in embryonic life possesses a fibrous structure in direct connection with the neuroglia through the radiating fibres of Müller. The fibrous substance between the lens origin and the distal wall of the primary ocular vesicle is its first trace. The vitreous body is a neuroglia product regarded

by Stucricker as an exoplasmic product. The cells found during the growth of the vitreous body only assist in forming the blood vessels. The zonula of Zinn originates in the same way as the vitreous.

Hereditary Cerebellar Ataxia. (P. Marie.)

Ten Cate, Dr. B. F., observed five cases in two branches of one family where the women inherited the disease from their mother. The following eye symptoms were observed.

Case I is a male 45 years old. The first symptoms appeared 8 years ago. Sight in right eye always worse than in the left. Sometimes he had double images. Has 8 healthy children. Slight exophthalmus of both eyes; left eye cleft is larger and has staring look. V. Graefe's symptoms not marked, slight strabismus div. sin., nystagmus horizontalis in both eyes, slight rotatory nystagmus in left eye. V. O. S. = 5/6, V. O. D. = 3/30 (uncorrected). Limited abduction and upward movement in both eyes. Fundi and fields of vision are normal.

Case II is a cousin of Case I and is 50 years old. Began to suffer 5 years ago. A certain degree of strabismus is always present. There is slight exophthalmus and the beginning of v. Graefe's symptom. Abduction, adduction and sursumduction are limited. Right strabismus convergence and nystagmus in the left eye, especially on convergence. Pupillary reaction for light and accommodation are normal. Left pupil somewhat larger.

Case III is 58 years old and showed the first symptoms about 10 years ago. Pupillary reaction for light and accommodation is normal. A slight nystagmus horizontalis with limited abduction and sursumduction is present, while convergence is normal.

Case IV is a brother to Case III, aged 49. He is a cousin to cases I and II. At the age of 25 while in the military service he had difficulty in marching. Only the left eye can be closed. He sees double images when looking to the right and left. Limited abduction, adduction and sursumduction; nystagmus horizontalis and exophthalmus. Fundi are normal.

Case V is a 17 year old son of IV. Poor vision and dizzyness first appeared 3 years ago. Left eye alone can be closed, has trouble in abduction and sursumduction. The left pupil is smaller than the right. Slight exophthalmus.

Fundi are normal. V. O. D. 4/20. V. O. S. 4/30 (uncorrected, patient is hyperopic).

Cases III and IV had two sisters that had the same disease, but had died from it at the ages of 45 and 47 respectively.

Retrobulbar Neuritis.

CUPERUS, DR. J. N., (*Med. Weekbl.*, Aug. 31, 1901), reports the following two cases. I. Male, aged 54, acquired syphilis some years ago, for which he received treatment at the time. June 15 he consulted Dr. C. stating that in the left eye he can only see with the periphery of his field of vision and that the centre of it is blind. The right eye is all right. For reading he uses + 2 for the right eye and + 3 for the left. Examination reveals no evidence of syphilis. The urine is free from albumen and sugar. The left pupil is narrower than the right and reacted very little to light and convergence. V. O. S. 5/20 not improved with lenses. V. O. D. 5/5. The temporal part of the left disc is somewhat grayer than the rest. With the perimeter a relative central scotoma was detected having the shape of a horizontal oval. White was seen as light gray, while red, green and blue could not be seen. Diagnosis, retrobulbar neuritis. Treatment, iodide of mercury and later potass-iodide, with the result that by the 26th of September the central scotoma had disappeared and the pupillary reaction had improved. Dec. 11, 1899, V. O. S. 5/10 with + 1.25 = 5/6.

II. A 40 year old farmer had always been healthy except that he had an attack of influenza in February, 1900, from which he had entirely recovered. Dec. 12, 1900, he first detected blindness of his left eye. Two days later he consulted Dr. C. V. O. D. 5/5. The pupil of the left eye does not react to light nor convergence. V. = O. Media are clear and the temporal side of the disc is somewhat paler than the right. Diagnosis, acute retrobulbar neuritis. Four days later patient went to the hospital for a sweat cure. Vision improved to light perception, while the pupil alse reacted slightly to light. On December 29 the pupils were equal in size and the left pupil reacted well to light and convergence and hand movements could be discerned at a distance of a metre. On January 11 he complained about nyctalopia V. = 5/30. The perimeter showed a central scotoma for colors including white, while the extent of the field was normal. On March 21 V. O. S. = 5/15. No cause could be found for this reduction.

ABSTRACTS FROM JAPANESE OPHTHALMIC LITERATURE DURING FIRST QUARTER 1902.

BY

Dr. Mitsiyasu Inouye.

OKAYAMA, JAPAN.

Translated from German Ms. by Dr. Würdemann.

General Corneal Opacities.

Yamane, Dr. K., Okayama. (*Igakukwaizassi*, N. 145.) The author quotes two cases of peculiar corneal opacity occurring in the clinic of Dr. Mitsiyasu Inouye. One case in a 22 year old man and the other of his sister of 14 years.

The opacities were situated in both corneæ occupying the central areas and were composed of a number of perfectly white generally well defined spots, the periphery of the corneæ remaining clear. The spots varied in size, but the smallest could be seen by the unaided eye; the smallest were roundish, the largest were irregular and seemed to have been formed by the confluence of the smaller ones; the areas between the spots were perfectly transparent. There were no new bloodvessel formation. The sensibility of the cornea in the opaque areas was somewhat diminished; the central portions of the larger spots somewhat lighter than the periphery and in a few the centers were clear so that a true ring was formed. All the spots seemed to be over a smaller one which was relatively deeper in the cornea. The outer layer of the opacity is smooth but uneven, so that by the keratoscope a sharply defined not uneven image is seen. There were no symptoms of irritation; both cases had trachoma, which was treated by silver with benefit to the visual acuity without even the slightest objective changes.

Note [I have at present such a case under my care and would refer to the article of Dr. William C. Posey, "An Unusual Form of Superficial Punctate Keratitis," p. 9, January, 1902, Annals of Ophthalmology, H. V. W.]

Modified Knapp's Operation for Pterygium.

OGAWA, DR. K. (*Chugwia-Iji Shimpo*, N. 523.) On account of the disfigurement which often remains after Knapp's operation, the author recommends that the upper half of the pterygium be divided in its length after it has been loosened and brought backward and above the undermined loosened bulbar conjunctiva and sewed into a little wound a small distance above the place of the pterygium. The process is repeated with the lower half.

Upon the Synchronous Use of Calomel with Iodine Preparations.

OGAWA, DR. K. (*Nihon-Gankwa-Gak'kwai-Zassi VI*, N. 1.) According to the author, the well known contra-indications of the above may be disregarded if the following method is used: After insufflation of calomel in the eye and at an interval of half a minute the bulb is massaged through the closed lids and later the remaining calomel removed with absorbent cotton.

Pathologic Anatomy of Striped Keratitis.

KOMOTO, PROF. J. (*Ibidem.*) Immediately after enucleation of a bulb with a large penetrating wound, the author examined the cornea histologically, which exhibited numerous stripes running at right angles from the wound and found that these stripes were caused not only by folding of Descemets' membrane, but also by opening of the lymph spaces of the cornea.

Filaria in the Human Vitreous.

NAKAYZUMI, DR. Y. (*Nihon-Gankwa-Gak'kwai-Zassi Band VI*, N. 3.) Hitherto there have been reported only six cases of filaria seen in the vitreous, and in five of these it was not definitely shown that these were true filaria, but they might have been arteria hyaloidea persistens. Only the case of Kuhnt is beyond dispute, so that the author hopes that the following case may be considered the second undoubted case of the disease: A 55 year old man, who, for several years up to about 8 months before the onset of the ocular affection, had eaten with much relish half-cooked horse flesh and cooked horse intestines, had remarked in the afternoon of the 11th of June, 1900, while he was reading that there suddenly appeared before the right eye a web-like appearance which on the next day became a whorl with bristles and then a

band with bristles and later became of spiral form. Since this time these three pictures, which were accompanied by living movements, have interchanged and then suddenly disappeared from the visual field, which happened especially at night. On the 5th of July the patient consulted the author for the first time. The examination showed that the visual acuity after the correction of moderate hyperopia = 1,0, the fundus and media were normal except for a thread-like body in the vitreous chamber which was found above and out from the papilla and which displayed lightening-like and continual movement. In the intervals in which the patient could not perceive any appearance, the foreign body could not be seen in the eye by the ophthalmoscope. On August 4th, the foreign body was found in the middle of the fundus somewhat outward from the papilla; on October 22nd the foreign body could not be found and the entopic phenomenon was not observed. After a while the patient observed in the upper and inner portion of the visual field a zigzag line which showed movements, but did not change its place. The patient complained of the sight becoming cloudy. In January, 1901, the author found the foreign body lying upon the upper and outer periphery of the retina rolled together and immovable. The length of the body was about 5 disc diameters and it was of the thickness of one of the larger veins. The fundus and the media as well as the visual acuity remained good. On the 15th of October, 1901, the patient only complained of the swinging of the zigzag line and of the cloudy sight. During the year and a quarter of his attendance at the hospital there was from time to time chills and light fever, but otherwise his health was good. The therapy was general. The blood which was examined both by night as well as by day, at no time showed the larva of filaria; the urine at no time contained albumen or fat globules. There was no appearance on the body of chronic lymph swelling, interstitial hyperplasia or the like.

The author calls the above described foreign body as a filaria and thinks its origin was due to the eating of horse flesh, more especially the intestines. Whether this was a filaria loa which did not enterely develope or a new, not yet known filaria, the author could not determine.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

CASEY A. WOOD, M. D.,

CHICAGO.

(Quarter Ending June 30, 1902.)

Bacteriology of Conjunctivitis.*

BIETTI, A. A rather heated controversy has been carried on by Pes and Bietti regarding the identity (or otherwise) of the Koch-Weeks with the Löffler bacillus. In the present article Bietti briefly sums up the results of his investigations. He calls the attention of Dr. Pes to the fact that the latter has never given a satisfactory reply to the evidence thus far brought forward, proving that the bacteria in question are absolutely distinct.

Researches upon the Immunization of the Eye Against Infection by the Pneumococcus.†

GATTI, A. Extensive studies have been made of infective germs, the action of their toxins upon the eye, the character of the lesions produced, etc., but few researches have been instituted as to how the organ reacts toward pathogenic agents when the individual has been immunized.

The studies of Ehrlich, Calmette and Delarde, and of Römer upon immunity against abrine, from which it appears that this toxin, extremely irritating as it is, applied to the conjunctival sac, becomes innocuous when the animal is either locally or generally immunized, or when it is previously mixed with antitoxin.

Metchnikoff and his pupils, through the study of the part the tissues and humors take in the phemomena of in-

*Anzora sulla batteriologia delle congiuntiviti. (*Annali di Ottalmologia*, Anno XXX, XII, p. 870.)

†Ricerche sull' immunizzazione dell' occhio contro l' infezione pneumococcica. (*Annali di Otralmologia*, Anno XXXI, 1-II, pp. 3-27.

munity, have incidentally made infective inoculations into the anterior chamber. In these experiments they have observed that while the ocular fluids are also slightly active the neutralization of the virus mostly takes place through the migrated leucocytes.

Gatti has studied the question and made experiments with the pneumococcus. This bacillus is a constant guest of the normal conjunctiva, as of other mucous membranes, and is one of the most frequent pathogenic organisms in the eye.

Speaking generally, these researches show that in the anterior chamber of the eye of the rabbit the infection manifests itself, even when to the immunity conferred by innoculation is added the effect of a local injection of an immunizing substance. In other words the aqueous humor of the vaccinated rabbit does not, as a result of inmunization, acquire a decided bactericidal quality or at least one superior to that which is usually possessed by the normal fluid.

From all his experiments Gatti deduces the following conclusions:

1. A superficial infection of the cornea of a rabbit, produced by a culture of pneumococci in blood serum, remains limited to the point of injection. Infection into the proper substance of the cornea produces deep infiltration, kerato-hypopion, ulceration, sometimes followed by perforation of the cornea, infection of the internal membranes of the bulb, and death of the animal.

2. Inoculation with the same virus, even in minute doses, of the anterior chamber produces severe local reaction, and invariably the death of the rabbit, in from 48 to 72 hours.

3. In the anterior chamber of an animal rendered immune by the general method, whether with anti-pneumococcic serum of an immunized sheep or by vaccination with a prepared culture, the infection develops as in the normal rabbit.

4. If instead of producing general immunity, either serum or vaccine be introduced into the anterior chamber, there is no immunity.

5. The aqueous humor of an immunized rabbit does not

confer upon the vitreous any decided bactericidal power toward the pneumococcus.

6. The principles set forth for the reaction of cellular elements in general toward serums (Bordet-Ehrlich) are not applicable in infections of the anterior chamber from pneumococci.

Summing up the results of these experiments, the author concludes that the anterior chamber of the eye of a rabbit not only takes no part in general immunization against the infection by pneumococci, but it is not capable of utilizing immunizing substances which may be directly introduced into it. Such infections, on the contrary, extend, as usual, to the deep membranes, producing generally a plastic inflammation, sometimes a suppurative one, and is followed almost always by atrophy of the eye.

Physiologic Action of the Positive and Negative Poles upon the Visual Field.*

TARDUCCI, A. This writer modestly concludes a long list of experiments upon the retina and optic centres by remarking that the increase and decrease in the visual field for white and colors depend, above all, on the excitation of the retina rather than of the centres, or that at least it is indispensible for these results to excite the retina, but he does not think it wise to come to a final conclusion, because one cannot, as yet, absolutely eliminate all the doubtful factors. He consequently limits himself to stating the following facts, as he observed them:

1. On applying the positive pole to the neck, and the negative pole to some other point of the body distant from the eye, and *vice-versa*, the visual field for white and colors remains unchanged.

2. With the positive pole over the eye itself, and the negative pole at an indifferent point, and *vice-versa*, the visual field for white and colors enlarges and contracts.

3. On applying the positive pole to one eye and the negative pole to an indifferent point with an intensity of 3 milliamperes for one minute; (a) The visual field for white and colors increases materially; (b) The visual field for white and colors increases immediately upon the application of the current, reaching its maximum enlarge-

*Differente azione ficiologica del Polo positivo e del Polo negativo sul Campo Viviso. (*Anni di Ottal.*, XXXI, pp. 106, 108.)

ment three days later, then contracting again, not returning to a normal condition until about the ninth day; (c) The field for green shows, most of all, the influence of the continuous current, then the red, the blue, the white; (d) The visual field for white and for colors enlarges most on the temporal side; (e) The visual field for white and colors of the other eye takes on slightly the same modifications.

4. With the negative pole over one eye and the positive pole over an indifferent point with an intensity of 3 milliamperes for ten minutes; (a) The visual field for white and colors contract markedly; (b) The visual field for white and colors contracts immediately on the application of the current, reaches its smallest extent two days after, then enlarges again, not returning to its normal condition until about the ninth day; (c) The green shows most of all the influence of the continuous current; (d) The visual field for white and colors contracts most externally; (e) The visual field for white and colors of the other eye partakes slightly of these modifications.

5. In order to have the greatest enlargement and contraction of the visual fields for white and colors it is necessary to apply the positive or the negative pole over one eye, and the other pole over an indifferent point of the body.

The Extraction of a Fragment of Iron from the Anterior Portion of the Eye with a Magnetized Knife.*

COFLER. Little has been said in Italy concerning the extraction from the interior of the eye of foreign bodies by means of electro-magnets. Cofler reports one case of extraction of a fragment of metal from the crystalline lens. The patient stated that six weeks previously he was struck by a fragment of iron in the right eye; that he kept up his work and experienced no trouble for three weeks; he then had a progressive decrease of vision, which finally scarcely left him sight enough to recognize hand-movements. Examination showed no conjunctival injection; in the cornea there was a small, white cicatrix a little below the centre; the anterior chamber and iris were normal; the crystalline

*Dell' estrazione di frammenti di ferro dalle parti anteriori dell' occhio con la lanci resa calamita. (*Annali di Ottalmologia*, Anno XXXI, 1-2—pp. 109-11.)

lens was opaque, except at a small point (a little to one side of the centre) which, in certain positions, gave a light reflex. This was certainly the bit of iron.

Examination with the sideroscope of Asmus modified by Hirschberg at first gave negative results, but a reexamination showed a decided deviation of the needle. Cofler feared that the smallness of the object would stand in the way of successful removal or at least render necessary a deep section and introduction of the magnet, or the extraction of the lens without the certainty of removing the foreign body. He consequently decided to transfix the lens with a keratome, and to hold the bit of iron in place by magnetizing the instrument. He introduced the knife, directing the point toward the foreign body, perforated the lens and connected the instrument with the negative pole of an electro-magnet. The result was the extraction of the lens and the foreign body together. The bit of iron had a diameter of 9/10 of a millimeter, and weighed 12 decimilligrams. The eye recovered without reaction and with a round black pupil. With + 12.V = 0.2. After 15 days the patient resumed his usual work. The author does not claim this to be a novel precedure.

Congenital, Filiform Anchyloblepharon.*

OBLATH, O. The case is published on account of its rarity. The patient was a child eight days old, seen at the civic hospital. The mother stated that the baby never could open the right eye well. A slight thread of tissue, which had united the two lids, was lacerated during the examination. This filiform band was thin, pale in color and about 2 millimetres in length. It arose from points just behind the cilia and the excretory ducts of the Meibomian glands of the two lids. Both bases were conical, wider than in the center and distant 5 millimetres from the internal canthus. There remained after the examination two little stumps of tissue attached to the borders of the lids, while the point of laceration showed a tiny, bleeding point. Lids otherwise normal. No anomaly in left eye. Stumps were excised for examination, and showed connective tissue.

This deformity was first described by Hasner, who re-

*Anchiloblefaro filiforme congenito. (*Archivo di Ottalmologia*, Vol. IX. p. 321.)

ported three cases. The anomaly has been found 4 times to be unilateral; once bilateral by Webster. Hasner found it in the middle of the lid margins. Webster and Wintersteiner in the temporal third. Bunzel and Oblath in the nasal third of the lids. Bloodvessels have almost always been discovered in the band, although neither, Bunzel nor Hasner mention this fact. Wintersteiner has clearly discussed the histological findings. Webster's report is identical with the last; Bunzel's technique must have been faulty, as the elasticity of the band was not constent with the presence of epithelium *alone*. Wintersteiner concludes that the bands are formed of connective tissue covered with epithelium of the pavement variety, continuous with that of the skin of eyelids.

The genesis of this deformity has been discussed by various authors. Hasner believes that it arises as an adhesion, the result of intrauterine inflammation. Webster's views coincide with those of Hasner. The presence of bloodvessels supports this view, rather than the theory of a partial arrest of palpebral development. Hasner recognized in one of his cases an eczema of the face, and supposed that an efflorescence might have caused an adhesion of the lids, which then became consolidated. Later on the movements of the lids gradually stretched the new formed tissue into a thread-like band. Wintersteiner differs in one point from Hasner; he supposes that a traumatic lesion might have been the cause of the adhesion. Bunzel refers it to an incomplete separation of the lids. The author thinks that the regular continuity of the epithelium at the margin of the lids with the covering of the palpebral band at one point is against the hypothesis of inflammation, and favors that of the physiological adhesion of the lids during intra-uterine life.

The Serum of Marmorek in Ocular Therapy.*

ATTANASIO, Salvatore. This is a very exhaustive, and valuable contribution to the literature of serum therapy. The writer refers to the various authors, beginning with Pasteur and Koch, who have worked on the toxins of infectious diseases—Buchner, Behring, Kitasato, Vernike, Roux and others. Serother-

*Il siero di Marmorek in terapia oculare. (*Archivo di Ottalmologia*, Vol. IX, p. 401.

apy, after demonstrating its extreme value in pathological processes in animals, has been transferred to man with success, particularly in the infective diseases. Not all serums have given equally good results, and effective as is Behring's serum, equally doubtful or debatable are those of pneumonia and others.

Marmorek, in the Pasteur institute (1894-95), succeeded in obtaining a serum preventive and curative of pyogenic streptococcus infections. As the result of these and other observations in infections produced by, or associated with streptococci, valuable observations were made in erysipelas, scarlatina, puerperal fever, phlegmon, etc. To obtain his serum Marmorek first tried the method of increasing the virulence of the streptococci, so as to obtain the most active toxin possible for inoculating animals, since by the ordinary artificial means of culture these microorganisms rapidly lose virulence. Man offers the best culture soil for streptococci. Marmorek used as a culture medium a mixture of two parts of human serum and one part of peptonized beef tea, or on account of the ease with which it could be procured, of one part of ascitic fluid and two parts of tea. He also found that a mixture of one part of blood serum of the ass, mule or horse, with two parts of beef broth was also well adapted for the preservation of streptococci in their full virulence. To further increase its power, he first inoculated rabbits, and then passed the infection through broth and serum; in two months he had produced a culture which killed all rabbits, in the dose of one one-hundred billionth of a cm., in a space of thirty hours. Contrary to the experience of the other authors (e. g. Singelheim), who employed old cultures and those that had been sterilized by heat, or diluted with trichloride of iodine, or (Roger) living cultures heated to 110°, a temperature that would destroy the toxic substance without injuring the vaccinated animal, Marmorek found that the grade of immunization increases with living cultures not sterilized by boiling. If these cultures possess great virulence at the first injection and the animals do not die, they become very resistent, confirming the general rule that the grade of immunity acquired is in direct proportion to the vaccinal inoculation. This immunity is relative, and resists only an injection of

a certain strength. Generally a streptococcus serum assists subsequent infections of the same virulence as that used for inoculation, and not a stronger one. In order to apply this to man, in whom the streptococcus reaches its greatest virulence, it is necessary to have a serum of animals immunized against streptococci much stronger than that commonly used. Marmorek increased the virulence of the cultures as much as possible, and with this immunized large animals—the ass, horse and ram, which alone could withstand such inoculations.

The serum of these animals has not only protective but curative qualities. By inoculating a rabbit with a certain dose, and after some hours injecting a millionth cm. of a culture, the animal successfully resists the poison, while rabbits not inoculated all die after the same dose. The proportion varies with the strongest dose of culture; an animal already infected is cured with greater difficulty, and much serum must be employed, and not too much time must elapse after the infection.

Marmorek had such good results with animals that he extended his experiments to man, and in March, 1895, published his first results in 46 cases of erysipelas cured in the service of Chiantemesse, by injection with doses of 5-20 cm. Only a single death occurred—from lung complications. With serum of high immunizing power (1:7000) Chiantemesse had, in 397 cases, five deaths, a mortality of 1.7 per cent. With a weaker serum (1:2000) in 107 cases, seven deaths, 6.54 per cent; with the strongest serum, (1:30,000) in ninety seven cases, one death, 3 per cent. mortality; he injected 20-40 cm. in each case.

The author was encouraged by these experiences of Marmorek and of Prof. Angelucci to apply the serum in cases of pseudomembranous conjunctivitis. He also used it in postoperative infections, and in all ocular diseases in which it was logical to employ serum, and also as a preventive n cases where there was a contraindication to operative interference on the ocular bulb, to prevent infection. For *curative* purposes he used it in:

A. Periostitis of the orbit.
B. Ocular phlegmon.
C. Phlegmonous dachriocystitis.
D. Acute trachoma.

E. Mucopurulent, purulent, pseudomembranous conjunctivitis.

F. Hypopion-keratitis.

G. Traumatic iridocyclitis.

H. Post-operative infections in cataract extraction.

Preventive:

To prevent post-operative infection in cataract extraction and in iridectomy, in cases affected with lachrymal diseases and in circumscribed conjunctivitis.

The results following these uses of Marmorek's serum are as follows:

A. Periostitis of the orbit. Complete relief of pain after 7 hours; rapid fall of temperature after 24 hours; complete cure on 7th day with one injection of 20 ccm. of serum; prevention of suppuration.

B. Ocular phlegmon. Relief of pain in about 10 hours, and reduction of local symptoms to subacute stage. Inflammation decreased up to the 13th day, after 2 injections of 10 ccm. each of serum.

C. Phlegmonous dacriocystitis. Lessening of pain in 6 hours and complete cessation after 15 hours, with temperature falling to normal. Complete cure on 3d day, without suppuration, under treatment, 30 ccm. in 2 injections.

D. Acute trachoma (circumscribed form). The beneficial results were apparrent in the accompanying iritis, rather than in the tracoma itself. In other cases benefit shown only by diminution of secretion.

E. Conjunctivitis, muco-purulent, purulent and pseudomembranous. The serum gave the best results in those cases in which the streptococcus was associated with the gonnococcus, all of them having corneal complications. Pain improved first, in a few hours after the injection; in the pseudo-membrane forms after 24 to 48 hours; this was followed by diminution of secretion and of all the symptoms. Ulcerations and infiltration of the cornea showed the best effects from the serum. In those forms in which the vitality of the cornea was lessened the author used nitrate of silver, and irrigation with the Kalt (0.04 per cent.) solution of permanganate of potash. In 5 cases he had 5 cures.

F. Hypopion-keratitis. Five cases. Small and me-

dium doses of serum were not so effective as the strongest, especially in the traumatic cases.

G. Traumatic irido-cycilitis. Two cases. Very effective in a case threatened with panophthalmitis. As small doses showed only gradual improvement, he tried the largest, 220 and 140 ccm., with complete cure as a result. He believes the cases would not have yielded to small doses.

H. Post-operative injections. Seven cases in which serum alone was used, with 5 cures; one cure with endovenous injection of sublimate solution and one bad result with the serum.

Two failures confirmed the laws discovered and laid down by Marmorek with reference to the use of serum. One of these cases was treated 56 hours after the infection; the other failed because the injections were not persevered in. Had he reached, with the latter instances, doses of 70 to 90 ccm. of serum he would probably have succeeded.

Preventive injections. Results brilliant in 9 cases. Contraindication to operative procedures (cataract) on account of probable infection of globe from dacriocystitis, muco-purulent conjunctivitis, moist eczema of scalp, stenosis of lacrimal duct, diabetes, ozena, etc. Injections were given and no infection resulted. Serum (20 ccm.) injected 10 minutes before operation. Subsequent injections when necessary. Cases dismissed on eighth or ninth day, the incisions entirely closed. The author thinks Marmorek's serum preferable as a preventive measure to all other means and believes it to be without their defects. It is applicable to all cases, is without danger, and permits immediate operation. As to how the serum acts to prevent infection is shown by a series of experiments. It may neutralize toxins in the circulation; it may lessen the virulence of the streptococci and the other ordinary agents in inflammation or it may confer on the organism, by its tonic power, a power of resistance to infection during the time when the incision constitutes a *locus minoris resistentiæ*. Moreover it aids the nutritive processes. Boucheron found that the serum in minute doses stimulates the nervous system.

On the whole Attantasio concludes as follows:

1. Marmorek's serum has a marked therapeutic effect in many inflammatory processes, both intra- and extra-ocular.

2. It has a special preventive action on post-operative infection. When the latter is to be feared injections should be made before operation and continued till a cure is established.

3. The serum has a marked and immediate action of a sedative nature on the pain of inflammation.

4. It seems to accelerate the healings of the operative incision.

5. It is absolutely harmless; it produces no albuminuria and has no injurious nervous effects, even when used for a long time in large doses. It produces no cutaneous irritation at the site of injection, or on any other part.

6. To get the best effects of the serum it is necessary to use it in the beginning of the inflammatory process, and in large doses. The later it is used, the less is the probability of success.

A Contribution to the Clinical Study of Trachoma, Its Geographic Distribution In the Province of Pavia.

LODATO (*Archivio di Ottalmologia*, Vol. IX, p. 472) gives a review of C. Bellinzona's study of all the cases of trachoma in the Clinica Oculista during a period of 12 years (1888–1900) published in the Boll. di Soc. Med-Chir. di Pavia, January 17, 1902.

The author follows the practice of the School of Pavia, which considers follicular conjunctivitis or acute trachoma and tracomatous conjunctivitis or chronic trachoma as two degrees of the same disease that can be separated by differential characteristics and should have a different prognosis and treatment.

From 1888 to 1900, in the clinic itself and in the dispensary, there were 862 cases of trachoma out of 6040 patients having ocular troubles; 14 per cent.

The statistics refer principally to location, age, season of the year when the cases occurred and their geographic distribution in the Province of Pavia. He then speaks of the various complications of trachoma and finally of prophylactic measures, among which he proposes two principal measures:

1. The enumeration of trachoma among the infective, contagious diseases, with compulsory notification by the physician of the public authorities.

2. Regular sanitary inspection of ocular diseases in public and private schools, industrial establishments, etc. This inspection should be intrusted by the Communal Authorities to a commission of oculists.

He gives a table that indicates at once the distribution of trachoma in the four divisions of the Province of Pavia.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas City, Mo.)

At Buffalo an ophthalmic club has been organized.

Dr. Susskind has established himself at II. Tarnowitzer-strasse, Beuthen.

Dr. J. E. Sheppard has removed his office to 130 Montague street, Brooklyn.

Dr. Eugene Richards Lewis has moved his office to 1110 Main St., Dubuque, Iowa.

Dr. J. G. Huizinga, of Grand Rapids, Michigan, has resigned as collaborator on the ANNALS.

Dr. G. L. Noyes has been appointed Professor of Ophthalmology in the University of Missouri.

Dr. John Edwin Rhodes announces his removal to the Reliance Building, 100 State Street, Chicago.

Dr. A. Chodin, professor of ophthalmology, recently celebrated the completion of his 30th year in practice.

Dr. G. A. Stevenson, of Albert Lee, Minn., will hereafter limit his practice to the eye, ear, nose and throat.

Dr. H. Urban, who was for sometime Assistant in the University Eye Clinic at Bonn, is now practicing at Koln.

Dr. Joseph Schöbl, Professor of Ophthalmology in the Bohemian University of Prague, died April 6, aged 65 years.

Dr. Albert B. Hale, of Chicago, will spend the summer in Germany and will return to his office September 15.

Dr. Arthur N. Alling has been appointed Clinical Professor of Ophthalmology in the Medical Department of Yale University.

A Baronetcy was recently conferred upon Mr. Anderson Critchett, F. R. C. S., Ed. Mr. Critchett is Senior Ophthalmic Surgeon at St. Mary's Hospital, London.

Dr. William McClure and Dr. Charles A. Oliver have been elected respectively President and Secretary of the Surgical Staff of Wills' Eye Hospital for the ensuing year.

Dr. Herbert Harlan, Professor of Ophthalmology in the Woman's Medical College of Baltimore, has resigned. Dr. F. M. Chisolm, Associate Professor, has also resigned.

Drs. H. V. Würdemann, of Milwaukee, Harold Moyer and E. J. Gardiner, of Chicago, have been elected as Professors in the Chicago Eye, Ear, Nose and Throat College.

Dr. Frank E. Tull was elected Consulting Oculist and Aurist, and Dr. Frederic M. Pendleton, Attending Oculist and Aurist, at the Blessing Hospital, Quiney, Illinois, April 30.

John Homans, of Boston, died May 4, aged 45. He was graduated from Harvard Medical School in 1882; he was president of the Massachusetts Charitable Eye and Ear Infirmary and was a member of many medical societies.

Dr. Edward Jackson wrote the Chapter on Ophthalmology in Progressive Medicine for 1902. The whole chapter is well worth perusal, giving as it does all that is new in ophthalmology, and written as it is in Dr. Jackson's well known conservative way.

From now on English speaking ophthalmologists will be accorded the opportunity to get an insight into ophthalmology of Asia. See the careful abstracts furnished by the latest addition to the ANNALS Staff, Dr. Mitsiyasu Inouye, of Okayama, Japan.

The XVI Congress of Italian Ophthalmologists will be held in Florence from the 12th to the 16th of October, 1902. Invitations to participate therein have been extended to a number of leading American ophthalmologists through the president Prof. Guaita.

Among the American ophthalmologists making journeys to Europe this summer are two members of the ANNALS Editorial Staff: Dr. Charles H. May, of New York, and Dr. Albert B. Hale, of Chicago. Dr. Geo. E. deSchweinitz, of Philadelphia, has also gone abroad.

Dr. George C. Harlan read a memoir of the late Dr. William Norris at a meeting of the Philadelphia College of Physicians, June 4, 1902. At the same meeting Dr. Edward Jackson read a paper on "The Degree of Protrusion of the Eyes, with an Instrument for its Measurement."

Wills' Eye Hospital.—At the last meeting of the Board of City Trusts, June 11, the resignation of Dr. William Thomson as attending surgeon of the Wills' Eye Hospital was accepted. Dr. Thomson was appointed consulting Surgeon. Dr. William Campbell Posey was then elected attending surgeon in Dr. Thomson's place.—Phila. Med. Journal.

George F. Carey, M. D., College of Physicians and Surgeons, New York, 1874, a specialist in diseases of the eye and ear, a member of the County Medical Society and attached to the staff of St.

Francis and Foundling hospitals, and the Manhattan Eye and Ear Infirmary, died at his home in New York, June 17, after an operation for Bright's disease, aged 66.

Among the representatives of the American Medical Association elected by the House of Delegates to represent America in the International Medical Congress to be held at Madrid, Spain, in March, 1903, were the following ophthalmologists: Dr. Casey A. Wood, of Chicago; Dr. Geo. E. deSchweinitz, of Philadelphia, and Dr. H. V. Würdemann, of Milwaukee.

We have been informed that our editorial colleague, Dr. Charles A. Oliver, of Philadelphia, is actively engaged in the preparation of a new Text-Book of Diseases of the Eye which considers the entire subject from a standpoint of the most advanced work in ophthalmology. The work is said to be superbly illustrated with a great number of drawings and sketches—all of which are original.

The Episcopal Eye, Ear and Throat Hospital, of Washington, D. C., has recently received a donation of $10,000 toward the erection of a new hospital building. This institution was organized five years ago, and has already outgrown its present quarters. A lot 57 by 116½ feet centrally situated, has been purchased, and it is expected the new building (to cost about $75,000) will be erected during the coming year.

Errata in Dr. Verhoeff's Article in April Annals, Vol. XI, No. 2.—The first word on page 205 should be "neither." The first sentence on page 206 should read, "Through N and the optic centres of the two eyes, O and O′ respectively, lines are drawn intersecting the horopteric circle in the points A and B and the two retinæ in the points *a* and *b*′." In the text on page 219 Fig. 10 and Fig. 9 should be read Fig. 8 and Fig. 7 respectively.

Electric Light on the Eyes.—A Russian specialist has decided that, contrary to the general opinion, electric light plays less havoc with the eyes than other forms of artificial light. He basis his deductions on the fact that disease and damage to the eye are proportioned to the frequency of the closure of the lids. He found that the lids close in a minute 6.8 times with candle light, 2.8 times with gas light, 2.2 times with sun light, and 1.8 times with electric light.—New York Medical Record.

Notice to Laryngologists and Otologists.—For the general good of the Section on Laryngology and Otology, the Section officers desire as complete a list as possible of all members of the American Medical Association who desire to be classified in this Section. It was ordered at the Saratoga meeting that this list be secured at once and published in the transactions for 1902. Kindly send your name at once to the Secretary, so that the published list may be complete and useful. [Signed.] John F. Barnhill, Secretary, Indianapolis, and Edwin Pynchon, Chicago, Committee.

Physicians in Siberia.—While physicians are rare in the Russian provinces of Europe they are very rare in Siberia. Because of the snow, ophthalmia is particularly prevalent, and on this account the Government at St. Petersburg sends a number of oculists to Siberia. The government reports show that 32,000 patients were treated and 11,000 operations performed last year. One of these traveling detachments of oculists, in a 6 months tour through the province of Irkoutsk, treated 3227 patients, performing 243 operations upon the eyes.—Le Soleil; Phila. Med. Journal.

The Stamping of "Compressed Tablets" by the Roman Oculists.—Stamps have been found in England which have been shown were used by the Romans to stamp remedies for producing clearness of vision, or for doing away with dimness of sight. The object aimed at by the medicament was specified in the stamp. It is noteworthy that the stamps so far discovered were designed for remedies for ocular diseases. The preparations were hardened with gum or some viscid substance, and was thus ready to be liquified at any time. Thus our supposedly very modern device of triturates or compressed tablets is only a revival of an ancient Roman custom.—American Medicine.

On the Significance of Bacterial Symbiosis in Infection of the Conjunctival Sac.—Rimovitch (Russki Archiv Patologii, etc., ol. XII. No. 2) found that the Koch-Weeks bacillus grows much more luxuriantly in conjunction with the diptheria and pseudodiphtheria bacilli and the staphylococcus pyogenes albus also favors the growth of the Koch-Weeks bacillus, but to a lesser degree. The supposition is advanced that some bacteria contain within their bodies a substance, probably globulin, which favors the growth of the Koch-Weeks bacillus. The author believes that this effect of symbiosis is not accidental, but plays an important role in the infection of the conjunctiva. [A. R.]—Phila. Medical Journal.

Philadelphia County Medical Society.—At a stated meeting, held May 14, Dr. Chas. W. Lefever exhibited "A New Inhaler Especially Intended for Use in Operations on the Eye and Face." It consists of metal, and comprises a mask for the nose and mouth connected at an oblique angle with a hollow cylinder expanding into a cup-shaped receptacle covered by a cap in which a bit of gauze can be placed for the reception of the anesthetic. It is provided with two valves, one opening outward and the other inward, permitting the escape of exhaled air and the other for the admission of the anesthetic vapor. Drs. Jas. Thorington and Geo. C. Harlan testified to the successful use of the apparatus in a number of operations.—New York Medical Record.

The Baltimore Eye, Ear and Throat Charity Hospital reports for the past year 5055 patients applying for treatment, 3162 white and 1873 colored. This is an increase of 8 per cent. over last year. The cases were divided as follows: Eye department, 3175; ear, 913; throat, 937. The dispensary visits numbered 17,745, about 60 per

day. The indoor department has been reorganized, and there is now a corps of trained nurses who are always on duty. Nurses are obtained from one of the general hospitals, and are given special instructions in the care of eye, ear and throat cases, and on the expiration of four months' service, if satisfactory, they receive a certificate. This is effected at but slight additional cost.—Journal Am. Med. Association.

At the meeting of the Illinois State Medical Society among other papers was one on Nephritic Eye Lesions. Dr. Willis O. Nance, of Chicago, presented a paper with this title, saying that ocular affections dependent on the kidney disease were not of infrequent occurrence. Every vascular structure of the eye might be involved. He alluded to edematous infiltration of the lids: also chemosis: vitreous hemorrhages: paresis of extrinsic muscles: interference with action of the ciliary muscle: iritis: cataract, and neuroretinitis nephritica. He said the last-named condition was of the greatest importance. He thought unilateral involvement was rare. He discussed the effect on vision, the progress of the disease, its prognostic significance, and also uremic amaurosis.—N. Y. Medical Record.

Spectacle Fitting Not Practice of Medicine.—The Appellate Court of the Second District of Illinois, in the case of Smith vs. People, has decided that an itinerant oculist and spectacle-fitter is not engaged in the practice of medicine. The appellant advertised as the "Great Chicago Eye Expert," and his advertisement also contained the following: "If you have blurring, dizziness, neuralgia, headaches, spots before the eyes, inflammation, granulation, winking, trembling spells, cataract, burning and smarting of the eyes, various brain affections entailing not only positive injury to sight, but untold misery, call immediately." The court reasoned that this is not the practice of medicine: "the defendant did not cure any of these ailments, that whenever his patrons ceased using the glasses defendant had supplied to them, their prior troubles returned." The case has been carried to the Supreme Court.—Journal Amer. Med. Association.

At the meeting of the Missouri State Medical Association held at St. Joseph, Mo., May 20-22, 1902, the following papers in ophthalmology were read:

M. F. Weymann, chairman, St. Joseph, Report of Committee on Ophthalmology and Otology: George E. Bellows, Kansas City, The Pupil as an Aid in Diagnosis: J. E. Jennings, St. Louis, Eye Strain—Its Causes and Treatment: W. L. Kenney, St. Joseph, Cancer of Eyelids Treated by X-Rays—Presentation of Patient: J. W. Sherer, Kansas City, The Evolution of the Eye: M. F. Weymann, St. Joseph, Demonstration of a Bandage for Eye and Mastoid Dressings.

Afflicted Man Cannot Come Here for Treatment.—A peculiar case of deportation, involving the denial of the right of a patient with an

incurable malady to land in this country to consult a specialist, is that of Guillomo Sangerius, a wealthy Spaniard of Havana.

Senor Sangerius arrived here from Cuba, June 7. A physician of the United States marine hospital service, detailed to the immigration service, boarded the steamer after it had passed quarantine inspection. He noticed that Sangerius had trachoma, and ordered him isolated in the United States marine hospitals for aliens. Sangerius protested and declared that he had come here to consult the most noted specialists of this country. He appealed to the humanity of the physicians, but they told him they could only obey the law. Senor Sangerius boarded a returning steamer under protest. —Chicago Record.

The Refracting Optician Does not Treat Disease!—An illustration, one of many similar ones constantly seen in the oculist's office, recently occurred in Philadelphia. A man consulted a physician asking for spectacles that would give him better vision than those he was wearing. The eyes-examined-free man had changed his lenses three times in a month. The oculist told the patient he had retinal hemorrhages, urged him to consult his general physician, warning him of the danger he ran by his carelessness, by continuing an active life, etc. Seeing that the patient would not take his advice, and even returned to the "ophthalmotrician," the oculist wrote to the general physician (who had not seen the patient for a long time) concerning the man's condition, his artheromatous arteries hemorrhages, etc. It was all in vain. The quack's glasses were the best; the patient refused to pay the bill of the oculist, would not see the general physician, and his suspicion of medical men grew under the fostering care of the refracting optician. Last week, two months after the oculist's warning, the patient dropped dead from cerebral hemorrhage.—American Medicine.

A Discourtesy in Consultation Practice.—We have been asked to take note of a too frequently occurring instance of thoughtlessness on the part of consultants, consisting in referring a patient to another specialist without considering the wishes of the general physician or colleague who first sent the patient. It is right and courteous that the family physician who refers the patient should know what disposition is made of the case. He may have had in mind that the disease would need the attention of still another specialist, may even have spoken to such an one; at least he has his rightful preference as to all consultants. But if without advice asked the patient is sent off to the consultant's friend unknown complications and even hard feelings may arise. In some cases the reference back to the original physician is difficult or even impossible, as, e. g., when the patient comes from a distance, in emergiuces, etc. But at least a frank notice of the facts in the case can be sent at once, and further instructions asked for. Such courtesy and consideration of the rights of the referer is not only good ethics and manners, but is quite as good policy.—Amer. Medicine.

The visit to this country of Prof. O. Haab, the eminent ophthalmologist of Zürich, Switzerland, was a source of much satisfaction both to our guest and to his many hosts. It has afforded us much pleasure to meet this scientist and especially to show him a portion of the immense interest of our country, not only of medical but of political and economic interest. He was sumptiously entertained in Saratoga, New York, Philadelphia, Washington, Baltimore and Chicago, being the guest of honor at a number of banquets. At the American Medical Association meeting at Saratoga he was elected by the House of Delegates to be an honorary member of the Association, which is an honor accorded only to two foreigners yearly. He was also elected as an honorary member to the Medical A. M. P. O. Fraternity. While in the above named cities, especially in Chicago, Philadelphia and New York, he had the opportunity of seeing the work of many of our eminent specialists and of examinining a number of complete special institutions in all of which he found the Haab magnet occupying a prominent position. Those American Ophthalmologists, who may attend the International Ophthalmological Congress to be held in Zürich two years hence, will find Dr. Haab ready to reciprocate the attentions here given him as he has heretofore to other visiting American confreres.

The proper sections before which papers should be read in the American Medical and other general medical societies is a matter which may well engage the attention of section officers and the writers of the papers themselves. There can be no difference of opinion as to the majority of papers, because their significance and teachings are only appreciated by the specialists attending by preference the individual section dealing each with his particular work. But if epilepsy may be due to eye-strain or to phimosis, if anemia may be caused by nasal stenosis, or chorea by oral abnormality, papers upon these subjects should not be read before the respective ophthalmic, surgical, laryngologic or stomatological sections. The physician who first and usually sees such patients is not the oculist, the surgeon, the laryngologist or the dentist, but is the general or family physician. The lesson chiefly concerns him. The rigid differentation of the sections tend to make the specialists overlook the intimate or deferred relations of diseases of one organ with those of others. The generalist, indeed, is fast becoming a specialist, as one after another of the specialists limits his field of work. At the present rate of progress his function will soon be solely that of an adviser as to what specialists the patient should consult. If this process extends and continues there will some time be need of a section for pan-specialists, in which shall be considered the inter-relations of the diseases of individual organs.—Amer. Medicine.

Exophthalmic Goiter.—Dr. L. Harrison Mettler, of Chicago, contributed a paper with this title. He reported three cases in a mother and her two sons.

He said the classification of this disease had been various in the past. To-day its real nature was hardly less mysterious than it was

formerly. As with all such affections, theories were rife. Dogmatic assertions in regard to it were certainly not allowable. Three prominent views of it were that it was a neurosis of the central nervous system; a hypersecretion of the thyroid gland, or a combination of neurosis and hypersecretion reacting mutually upon each other. That it was not due to hyperthyroidization primarially was shown by its etiology (heredity, age, sex, mental shock, anemia, etc.). By the peculiar symptomatology (alternate prominence of tachycardia, struma and exophthalmos; hyperidrosis, trembling, psychic state, and other secondary symptoms) by the pathologic findings (condition of the thyroid gland, of blood and other organs); by the prognosis (cases often suddenly recovering under influences other than those that affect the thyroid gland); and, lastly, by the therapy (rest, electricity and nerve sedatives, usually giving the best results). On the other hand, all these factors pointed strongly to a neurotic origin for the disease.

Exophthalmic goiter and myxedema were not antithetical, except in some few minor symptoms, hence, if the latter was due to diminished secretion, it was not to be concluded that the former was due to an excess of thyroid secretion.—N. Y. Medical Record.

At a meeting of the New York County Medical Association the application of adrenalin being under discussion and its uses:

In the Treatment of Diseases of the Eye.—Dr. Wilbur B. Marple discussed this subject. He said that the action of the suprarenal extract in relieving inflammatory redness of the eye was certainly little short of magical, and it delighted the patient, but so also would the patient be pleased by the use of morphine for the relief of pain. We should ask ourselves seriously whether or not suprarenal extract was curative in the long list of diseases for which it had been recommended. His own experience led him to assert that it was not curative. Two cases of conjunctivitis were reported in which, contrary to his instructions, adrenalin had been used for many weeks. Both patients found it necessary to increase the frequency of the instillations after a short time, and finally to increase the strength of the solution, and, instead of the drug being curative, it had distinctly aggravated the local condition. There could be no question that adrenalin would secure a bloodless operation, but he was far from being convinced that this use of the extract was desirable, although undoubtedly, exceedingly convenient. There was certainly an increased possibility of infection, and hence he would not think of using it in an operation in which the globe was opened, and there was reason for believing that the use of this remedy lowered the resistance of the tissues and interfered with healing. For slight operations on the eyelids the extract could be used apparently without harm and enable the operator to dismiss his patients from the office more quickly. A remarkable case was referred to, in which an epitheliomatous growth on the inner edge of the eyelid, which had existed for a number of years, began to diminish in size coincidently with the employment of adrenalin solution as a placebo.

After having used this solution for a number of months, it was found that the growth had entirely disappeared and the cosmetic result was far better than could have been secured with the knife. The action of adrenalin in this case was explained by Dr. Marple on the theory that it destroyed the blood supply of the epitheliomatous mass. The patient was exceedingly susceptible to the action of adrenalin, because when a pledget of cotton moistened with this solution was laid upon this lady's cheek the skin became white underneath the cotton.—New York Medical Record.

Awarded the Boylston Prize.—Dr. Robert Lee Randolph, associate professor of ophthalmology and otology in the Johns Hopkins Medical School, has been awarded the Boylston prize by Harvard University for his essay entitled "The Rôle of Toxins in Inflammations of the Eye." The contribution is experimental in character, and the author has been at work on it for the past two years in the pathologic laboratory of the University. Among other things the work shows that not only do the bacteria themselves produce inflammation when brought in contact with the eye, but that their toxins can produce it also. Many bacteria, however, have not the power to produce these soluble toxins. Dr. Randolph shows that our ideas on this subject need revision, and that many bacteria probably produce inflammations through the agency of properties which previous tests have failed to discover. It is also shown that many of the most serious external inflammations of the eye are caused not only by the presence of bacteria between the lids and eyeball, but that the harmful effects of these bacteria are rendered more certain if the individual should rub the eye when the infectious material flies into it. The rubbing removes the epithelial covering of the eyeball, and thus an entrance is made through which the bacteria, which are always present, can enter the tissues. For instance, when certain organisms suspended in sterile water are dropped continuously upon the eye of a rabbit, even for a considerable time, no inflammation results, but let a slight wound or abrasion of the eyeball be made and inflammation always follows. The practical bearing of this discovery is obvious. Eyes into which infections or irritating substances have entered, should never be rubbed, although the inclination to do this is usually very strong. The Boylston prize rarely finds its way out of New England. Dr. Randolph was awarded the Alvarenga prize by the University of Pennsylvania in 1900 for an experimental work on the crystalline lens. He was one of those who received the honorary degree of M. A. at the recent jubilee of the Johns Hopkins University.—Journal American Medical Association.

When is a Specialist a Specialist?—Skill Required.—The malpractice case of Baker vs. Hancock, reported on page 1270 of The Journal of May 10, 1902, has been before the Appellate Court of Indiana again, on a petition for rehearing. After stating that "a physician is a physician whenever he acquires sufficient learning

to be entrusted by the proper legal authorities with a legal license to practice medicine, and it is actually practiced," the court says that the attorneys for the party sued, in their brief upon this petition, inquired: "When is a specialist a specialist?" The court answered that the question is not one of law; it is a question of fact. The party sued may or may not have qualified himself as a specialist. Whether he had done so was a matter within his own knowledge and primarily for his own determination. Having arrived at the conclusion that he possessed such qualification, it still remained optional with him as to whether he would hold himself out and receive and treat patients on the basis of it. When he determines to do this and does it, it then becomes his duty to exercise that degree of skill which he thereby represented himself as possessing. To relieve one practicing medicine under such circumstances of responsibilities commensurate with the pretension by which patients are secured and compensation fixed, would be to give ignorant practitioners license, to defraud and to place innocent patients at their mercy. The definition of the noun "specialist," as given in the Standard Dictionary, was followed in the original opinion. It is said in that work to mean "more especially a physician or surgeon who applies himself to the study and practice of some particular branch of his profession." The thing on account of which the party suing sought to recover damages was the alleged negligent destruction of part of his nose. Two paragraphs of the complaint proceeded upon the theory that the party sued held himself out as a specialist. If, so holding himself out, he undertook to diagnose and treat the case of the party suing as coming within the specialty so practiced by him, he was bound to use that degree of skill which such practitioner of necessity should possess. It became his duty to give every patient to whom he undertook in that capacity to render service the benefit of that reasonable skill exacted by the law from one thus engaged. It was argued further that in holding testimony as to the treatment of other patients incompetent, the court omitted to consider the "connecting link of sameness." In this the court says counsel were mistaken. The only sameness between the cases alleged to have been cured and that of the party suing, so far as shown, was the remedy used by the party sued. With these statements the court overrules the petition for rehearing, leaving the case with a judgment in favor of the party sued reversed and a new trial ordered.—Journal A. M. A.

College of Physicians of Philadelphia—Section on Ophthalmology. —Meeting held March 18, Dr. William Thomson in the chair.

Dr. William Campbell Posey, exhibited a case of Tubercle of the Iris in a colored child, 6 years old. Notwithstanding cod-liver oil, mercurial inunctions, and the local application of atropin and boracic acid, the tubercle slowly reached the size of a large pea. Enucleation was advised. Dr. Posey also showed a coquille to aid in the detection of diplopia.

Dr. James Thorington exhibited the De Zeng Luminous Retino-

scope. The great advantages of the instrument are its portability and greater illumination without heat. Drs. W. C. Posey and E. A. Shumway detailed the history of a case of Carcinoma of the Eyelids, with secondary involvement of the eyeballs, removed by extensive plastic operations, followed by recurrence, in a female, 61 years old. As a consequence, enucleation and evisceration were necessary. Dr. Sweet referred to a case of extensive epithelioma of the eyelids, in which the disease had caused destruction of the right eyeball, and had spread halfway across the nose.

Dr. G. E. de Schweinitz gave the history of a man, aged 23, suffering from Chronic Inflammatory Glaucoma and Bilateral Horizontal Nystagmus. Bilateral sympathectomy was performed, the interval between the operations being six weeks, by Drs. W. Joseph Hearn and J. Chalmers Da Costa. The operations accomplished nothing more than was secured with eserin. The pathologic changes in the ganglia excised consisted of a marked hyperplasia of the connective tissue. The ganglionic cells were pigmented and degenerated. Dr. Harlan referred to the probability of the permanency of the myosis following excision of the sympathetic ganglia. Dr. Hansel agreed that the operation was justifiable after all other means had failed.

Dr. G. C. Harlan showed the eye of a negro boy, 15 years of age, removed for Congenital Glaucoma. Both eyes were hupthalmic and sightless. The eyes were enucleated for the relief of pain. Examination of the specimen showed complete separation of the retina, the disc cupped, and the lens undergoing calcarious degeneration. Dr. Hansell described the clinical and microscopic points of interest in glaucoma following hemorrhagic retinitis, and in primary glaucoma in which profuse and destructive hemorrhage followed iridectomy. Dr. de Schweinitz showed sections of eyeballs removed for glaucoma, in all of which the interference with the excreting channels was well seen.

Dr. John T. Carpenter reported the clinical history of a Diabetic Patient, aged 51 years, with rapid changes in refraction accompanying variations in the amount of sugar in the urine. Glycosuria greatly lessened under suitable treatment and rigid diet. With this improvement vision rapidly failed. Upon the return to a liberal diet, vision again failed. The final result was low myopic astigmatism. Dr. Carpenter referred to the rarity of this condition in glycosuria. He attributed the rapid changes of refraction to alterations in the refractive index of the lens.—Philadelphia Medical Journal.

The Annual Meeting of the American Ophthalmological Society was held at the Pequot House, New London, Conn., July 16-17. The following is a list of some of the papers presented:

1. A New Speculum. Dr. F. D. Skeel.

2. The post-operative history of fifty cases of Simple Chronic Glaucoma. Dr. C. S. Bull.

3. Notes on some cases of Simple Chronic Glaucoma treated by

resection of the superior ganglion of the cervical sympathetic, with sections of ganglia. Dr. J. E. Weeks.

4. A case of Endothelium of the Orbit. Dr. C. A. Veasey.

5. Melano Sarcoma of the Orbit, with mieroscopic and macroscopic specimens. Dr. S. B. St. John (pathological report by Dr. A. J. Wolff).

6. Report of case of Congenital Orbital Cyst, with microphthalmus. Dr. G. C. Harlan.

7. Ossification of Chorioid, with report of four cases and rèsumè of literature to date. Dr. B. L. Millikin (with assistance of Dr. J. C. Darby).

8. A case of Metastatic Carcinoma of the optic nerve, with peculiar degeneration of both nerves—clinical and pathological report. Dr. Ward A. Holden.

9. A case of Double Metastatic Carcinoma. Dr. E. E. Jack (pathological report by Dr. Verhoeff).

10. A case of Cavernous Sinus Thrombosis. Dr. E. E. Jack (pathological report by Dr. Verhoeff).

11. The Conjunctival Flap and the Cataract Wound. Dr. F. M. Wilson.

12. Case of Delirium Tremens following Cataract Extraction. Dr. T. R. Pooley.

13. Death from Diabetes after Cataract Extraction. Dr. T. R. Pooley.

14. Some recent experiences with Sub-conjunctival Injections in Orbital Disease. Dr. C. S. Bull.

15. Report of examination of Eyes of Children in Public Schools of Memphis. Dr. J. L. Minor.

16. A simple use of the circle of diffusion in the correction of Ametropia. Drs. William Thomson and A. G. Thomson.

17. The use of Models in teaching of Ophthalmology, especially as to refraction and convergence. Dr. B. A. Randall.

18. On the insertions of the Ocular Muscles. Dr. L. Howe.

19. The ideal result to be kept in view in the operative treatment of Convergent Strabismus in Children. Dr. S. Theobald.

20. A note on the Ophthalmoscopic Variations in the Normal Fovea. Dr. H. T. Hansell.

21. On the confusion in methods of using prisms. Dr. L. Howe.

22. Additional notes of a case of High Astigmatism. Dr. B. L. Millikin.

23. A case of unilateral temporal Hemianopsia in which the Wernicke Hemianopsia pupillary reaction was present. Dr. C. J. Kipp.

24. Two cases of detachment of the retina traumatic in origin, treated by drainage-incision. Dr. W. K. Rogers.

25. A methyl-alcohol debauch and its results. Dr. H. W. Ring.

26. Several cases of Unusual Eye Diseases. Dr. J. H. Claiborne.

27. A case of vicarious menstruation from the lower lids. Dr. J. H. Claiborne.

28. Histologic study of the lenses of a hanged criminal. Dr. C. A. Oliver.

29. Study of the ocular changes produced by the injection of pure cultures of the Bacillus Typhosus into the Vitreous chamber of rabbits and guinea pigs. Dr. C. A. Oliver.

30. The extraction of Steel from the Vitreous Chamber. Dr. S. D. Risley.

31. The value of partial résection of the tarsal cartilage in the operative treatment of congenital Ptosis. Dr. E. Gruening.

32. Circumscribed Exudative Chorioiditis. Dr. H. Friedenwald.

33. On improvement of vision in Amblyopia. Dr. H. Friedenwald.

The following recommendations of the Section on Ophthalmology of the American Medical Association, which had been adopted after several years' consideration of the subject were submitted to the House of Delegates and to the association for its final official endorsement by H. V. Würdemann, Delegate from the Section on Ophthalmology to the House. They were indorsed and a resolution passed to be printed and officially sent by the officers of the American Medical Association to the officers and railroad corporations and other interested parties.

Recommendations of the American Medical Association Regarding Tests of Sight and Hearing for Railroad Employees.—Section 1. It is essential that railroad corporations should require definite and scientific examinations of the sight and hearing of those employees who will be at all concerned with the active operating of trains, or in giving and receiving signals.

Section 2. Such examination should, *whenever possible*, be made by regularly appointed eye and ear surgeons; and in all cases be conducted according to the instructions, and under the supervision of a regularly appointed eye and ear surgeon, and with apparatus and under conditions approved by him, and all doubtful cases should be referred to him for personal examination.

Section 3. New men should be required to hear the spoken voice at 20 feet in a quiet room, and have healthy ears.

Section 4. The acuteness of vision should be tested by the test types of Prof. Snellen, or those which conform to his standards.

Section 5. The following minimum requirements should be adopted for acuteness of vision:

CLASS A.

	Entrance to service or promotion.	Re-examination of those in the service.
Enginemen (road service). Firemen (road service).	20/20 in each eye tested separately without glasses.	20/30 with both eyes open without glasses. Each eye should also be tested separately and the vision of each noted.

CLASS B.

Other employees in the engine, train or yard service, and car and engine inspectors.	20/20 in one eye and not less than 20/40 in the other. Tested separately without glasses.	20/40 with both eyes open, without glasses. Each eye should also be tested separately and the vision of each noted.

CLASS C.

Towermen. telegraph operators, station agents, section foremen.	20/20 in one eye and not less than 20/40 in the other. Tested separately with or without glasses.	20/40 with both eyes open with or without glasses. Each eye should also be be tested separately and the vision of each noted.

CLASS D.

Crossing flagmen.	20/40 with both eyes open, with or without glasses.	20/50 with both eyes open, with or without glasses.

Section 6. The color-perception should be tested by means of the colored worsteds of Professor Holmgren, preferably with worsteds tagged for the purpose of record; also, in every case an additional test should be made with a lantern showing a number of colored lights, which can be varied in their size and intensity.

Section 7. (a) Employees enumerated in Class A, must reach the visual standard without glasses, and should not be allowed to wear distance glasses when on duty.

Section 7. (b) Employees enumerated in Classes B, C, D, should be allowed to wear glasses when on duty, and should be required to do so if the wearing of glasses is necessary to bring vision up to the proper standard. They should always be required to carry an extra pair of glasses when on duty, in case of accident to one pair.

Section 7. (c) Employees enumerated in class A should not be retained in such positions if vision sinks below 20/30 with both eyes open, or if the spoken voice cannot be heard in a quiet room at 15 feet.

Section 7. (d) Employees enumerated in Classes B and C should not be retained in such positions if vision sinks below 20/40 with both eyes open, and Class D whose minimum standard should be 20/50; or if the spoken voice cannot be heard in a quiet room at 10 feet.

Section 8. There should be two general standards of visual and aural requirements, viz., one for new men hoping to enter the service, and to be actively engaged in the operation of trains, and in giving and receiving signals; and one for those men engaged in similar work, who have been uninterruptedly in a company's service for five years, either the company from which employment is sought, or some other company enforcing similar regulations. These latter may be regarded as old employees.

Section 9. Re-examination should be made of all such employees every three years; and after any severe illness, or accident, or any occurrence which seems to cast doubt on the visual and aural capacity of the individual. Re-examinations should also be made more frequently on men known to be excessive users of tobacco, or to be suffering from syphilis, albuminuria, diabetes, or acute or chronic eye or ear diseases. They should always be examined before promotion.

Section 10. Men known to be excessive users of liquor should not receive employment for the services above designated (Section 5). The co-operation of the employees themselves should be sought by regulations that will encourage them to report promptly any temporary impairment of vision or hearing.

Respectfully submitted on behalf of the Section on Ophthalmology of the American Medical Association.

H. V. Würdemann,
Edward Jackson,
Leartus Connor,
} Committee.

BOOK NOTICES.

Ophthalmic Operative Technique.

S. Baudry, Professeur de clinique ophthalmologique a l'Université de Lille. Extrait du Traité de Technique operatoire de operatoire de Monod et Vanverts. 8 Vo., pp. 605-726. Masson et Cie, Editeurs, Paris 1902.

This brochure is conveniently divided into eleven parts, preceded by a brief, though most interesting, chapter on disinfection and anesthetics. Beginning with the most recent and the best methods employed for the extraction of foreign bodies from the eye, descriptions of the technique used to rapidly cure the various and many forms of conjunctival, corneal, and scleral distortion are next given. In rapid succession the plans of operative procedure best adapted to attack the iris with its many most important deformities; the newest method for removal of both primary and secondary cataract; the most approved operations upon the extraocular muscles; the best adaptations for partial or total removal of the eyeball; the least injurious and the most efficacious modes of radical therapy used for lacrimal affections; the plans of reaching and treating the orbital cavity; and finally, a detailed description of the many and varied methods for removing disturbing lid deformities, are all made to follow—these practically constituting the contents of the volume.

The text is fully illustrated, the subject matter is written in a fluent style, and there are a series of most excellently compiled and well arranged bibliographical references.

The work will repay a most careful reading by anyone who may be interested in the subject. C. A. Oliver.

Stereoscopic-Photographic Atlas of the Pathologic Anatomy of the Eye.

Elschnig, Prof. Dr. A., Vienna. Stereoskopisch-Photographischer Atlas der Pathologischen Anatomie des Auges, Theil III u. IV, mit beschreibendem Texte. Wien. Price 4 M. ($1.00) each part.

Parts III and IV, 32 plates, completing the series of 64 stereoscopic-photographic plates of enucleated eyeballs with case histories, is now complete. Parts I and II were most favorably mentioned in the January, 1902, Annals of Ophthalmology (see p. 129). I consider these plates most satisfactory for teaching purposes, have been using them with my own students and recommend them

to all my colleagues who are connected with teaching institutions as well as to other oculists who are desirous of having a work of reference in which they may at a glance find a counterpart of some case that they may have under observation or which has come to enucleation. The photographic work and reproduction is highly commendable. The brief case histories are all of interest.

H. V. WÜRDEMANN.

Atlas of Topographic Anatomy.

Zuckerkandl, Prof. E., Vienna. Part IV. Pelvis, in 113 colored wood cuts with explanatory text, 179 pages. Wien and Leipzig, Wilhelm Braumüller, 1902. 10 M. $2.50.

The high praise we gave this atlas in the ANNALS of July, 1900, January and July, 1901, when reviewing the three first parts, must unreservedly be paid also to part IV. The drawings, which represent the contents of the pelvis, are very sharply and artistically executed, partly in life size. They speak for themselves, so that the text is very brief. The atlas aims especially at practical usefulness and is of very great value to the operator. Part V is under press. It will contain the topography of the hernial portals and the limbs, and will conclude the work. C. ZIMMERMANN.

Stereoscopic Medical Atlas.

Ophthalmology, edited by Prof. W. Uhthoff, Breslau. No. 5 by Prof. Elschnig, Wien. No. 6 by Dr. Heine, Breslau. Leipzig, 1902. Joh. Ambr. Barth. Each number 5 M. $1.25.

In the April No. of the ANNALS we set forth the great merits of this beautiful atlas. No. 5 contains, in life size, splendid stereoscopic views of trachomatous and spastic entropium, ectropium, gummata of lids, condyloma of tarsus, spring catarrh, tuberculosis of conjunctiva, leucoma with symblepharon, dermoid of the sclerocorneal junction, keratoconus, cavernous tumor of the orbit, orbital phlegmon.

No. 6, by Heine, gives contributions to the comparative and embryological topography of the brain, at the same time a stereophotographic method to ascertain the situation of superimposed organs by successive photographs on the same plate. The pictures show heads with brains of human fetus of the 4th to 8th months of gravidity, of a child a few weeks old, an adult, the carp, frog, pigeon, guinea-pig, dog and monkey, with explanatory text. In the preface H. describes the technique. The pictures show in great perfection the brain in the skull as if the latter were made of glass, and thus furnish an excellent means to study the topography and natural situation in their reciprocal relations. C. ZIMMERMANN.

Ophthalmologic Essays.

Sammlung zwangloser Abhandlungen aus dem Gebiete der Augen-

heilkunde. Mit besonderer Ruecksicht auf allegemein-aerztliche Interessen. Edited by Prof. A. Vossius, Giessen. Halle a. S. Carl Marhold. One vol., containing eight numbers, 8 M. $2.00.

The collaborators are Prof. Axenfeld, Prof. Baas, Freiburg; Prof. Czermak, Prag; Prof. Greeff, Berlin; Prof. Groenouw, Breslau; Prof. Haab, Zürich; Prof. Hess, Würzburg; Prof. Knies, Freiburg; Prof. Schirmer, Greifswald; Prof. Schlosser, München; Prof. Uhthoff, Breslau.

Almost 4 volumes of these essays have appeared, which discuss a very readable and compendious manner in various subjects of ophthalmology. They are issued unsystematically, and each essay is complete in itself. Vol. III contains: Prof. Bach, Marburg: The eczematous eye diseases. Dr. Hirsch, Carlsbald: On ocular affections due to gout. Dr. Huebner, Cassel: The operative treatment of high myopia. Dr. P. Roemer, Giessen: Gangrene of the lids. Dr. Brandenberg, Trier: Gun-cap injuries. Prof. Schirmer, Greifswald: Vaccinia of the eye. Prof. Vossius, Giessen: On hereditary diseases of the eye. Dr. G. Ischreyt, Riga: Septic affections of the retina. Prof. Schlosser, Muenchen: The best practical method of testing the visual field.

In the April ANNALS we have reviewed Nos. 4 and 5 of Vol IV: The therapeutic value of spectacles by Dr. H. Feichenfeld, Luebeck. Nos. 1 and 2 contain:

Resection of the sympathetic nerve in glaucoma. Dr. M. Ziehe and Prof. Th. Axenfeld, Freiburg. 84 pp. with 10 figures, 1901. 2 M. 50 cents.

Five cases of resection of the sympathetic nerve from the eye clinic at Rostock are reported in detail, followed by an abstract of the clinical histories of 50 cases from literature with critical remarks. The conclusion is that in all cases of glaucoma, in which the therapeutic measures, so far at our command, prove insufficient, the extirpation of the superior ganglion is a justifiable and recommendable attempt, although a cure is by no means always to be expected. The essay is very carefully prepared and gives a very exhaustive and detailed resumé of the present standpoint of our knowledge with regard to this new method of treatment.

No. 3: Hemianopic reflex immobility of the pupils. Prof. A. Vossius, Giessen, Halle a. S. Carl Marhold, 1901.

Wernicke's doctrine of hemiopic pupillary reaction has still as many opponents as adherers. V. belongs to the latter and considers its occurrence proven beyond doubt by a recent case of his of total blindness of left eye and temporal hemianopia of right eye with total labyrinthine deafness of left ear after a fall. V. assumed fracture of left petrous bone and walls of optic foramen with laceration of left optic tract and nerve.

Nos. 6 and 7: *Glaucoma and its treatment.* Prof. O. Haab, Zürich. 59 pages, Halle a. S., Carl Marhold, 1902. 2 M. 50 cents.

Haab's lucid and attractive article gives a splendid view of our

actual knowledge of glaucoma, its pathogenesis, pathological anatomy, clinical features and modes of treatment, with quite a number of original observations. Of the latter we mention the opacity of cornea in infantile glaucoma, caused by rupture of Descemet's membrane, and the importance of diseases of the ocular bloodvessels in the etiology of glaucoma, which also have a greater share in creating atrophy of the optic nerve than the increased tension. H.'s remarks on the treatment of glaucoma are of especial value, as he speaks from his large personal experience. While iridectomy is the main operation, the value of anterior sclerotomy as an adjuvant, and in some forms of glaucoma as the preferable and less dangerous operation, is duly set forth and confirmed by practical results, given in statistical form. We urgently advise our readers to study H.'s excellent work. C. ZIMMERMANN.

Transactions of the Twenty-Ninth Meeting of the German Ophthalmologic Society, Heidelberg, 1901.

Edited by W. Hess, E. von Hippel, Th. Leber and A. Wagenmann. 293 pages with 7 plates and 8 figures in the text. Wiesbaden, J. F. Bergmann, 1902. 8.60 M. $2.15.

We take great pleasure in bringing to the notice of our readers the appearance of this stately volume which is full of new and interesting detail. The meeting commenced with a commemoration of the 50th anniversary of the invention of the ophthalmoscope by H. von Helmholtz, by H. Snellen and W. Uhthoff. A photograph of the original ophthalmoscope is reproduced. Then follow:

W. A. Nagel, Freiburg: On dichromatic color system.

N. argues against the antagonistic color theory of Hering as untenable from general biological reasons. The dichromatic color systems are reduced forms of the trichromatic system. Instead of red blind and green blind he advocates the terms, devised by von Kries, protanope and deuteranope.

L. Bach: On the methods of examining the pupils, causes of anisocoria and disturbances of pupillary mobility.

B. pleades for a systematic observation of the pupillary phenomena as of great diagnostic and prognostic value.

K. Baas, Freiburg: On a rare pupillary reaction and on the center of the pupil. An attempt to explain the pupillary phenomena of Galassi.

E. von Hippel, Heidelberg: On the pathology of the corneal endothelium. v. H. produced parenchymatous keratitis by tying the vorticose veins in rabbits. The subsequent necrosis of the endothelial cells allows the aqueous to penetrate into the cornea and thus to create keratitis.

E. Hertel, Jena: On the pathological anatomy of the cornea. H. examined a great number of sections of corneal ulcers in man (parallel to the surface) and found marked alterations in the corneal corpuscles, varying with the different stages of the ulcers.

F. Best, Giessen: On the occurrence of glycogen in the eye. Glycogen occurs in the eye quite frequently. B. found it in malignant tumors and in inflammations and suppurations, located in the exudations, pus cells, pigment and epithelium, retina and ciliary body. It is undoubtedly a product of the latter, not of the leucocytes.

Th. Leber, Heidelberg: On phlyctenular inflammation of the eye. A certain similarity of the histological structure of phlyctenules to that found in tuberculosis is called by L. tuberculoid structure, characterized by the occurrence of giant cells, without any prejudication as to the nature of the process. The possibility of endogeneous origin of the phlyctenules has become more likely by the proliferation of the endothelium and the occurrence of giant cells in the lumen of the bloodvessels. The experimental progressive keratitis by injecting sterilized, but still virulent, tubercle bacilli into the cornea and under the conjunctiva is for L. another probability of endogeneous origin and connection with scrophulosis. L. intends to continue these experimental researches.

C. Hess, Würzburg: Excitation of the retina by venous congestion. Sudden venous congestion in forced expiration causes an excitation of the retina at the exits of the 4 vortex veins, and is perceived subjectively in form of 4 luminous patches.

A. Siegrist, Basel: On some not well known affections of the optic nerve. S. found in quite a number of cases dark patches in the optic nerve, due to destruction or fatty degeneration of the medullary fibres, and thinks that they may explain some cases of amblyopia without visible changes.

G. Pfalz, Düsseldorf: On the development of juvenile myopic eyes under the constant use of fully correcting glasses. Fully correcting glasses act against the progress of myopia. Not accommodation, but the lack of accommodation, promotes the progress of myopia. P. illustrates these observations on cases in tabulated form.

L. Heine, Breslau: On full correction of myopia. H. also advocates the constant wearing of fully correcting glasses in myopia. In the discussion Drs. Hess, Wicherkiewicz, A. von Hippel, Straub, Schwarz, Lucanus, Axenfeld, Mayweg, Uhthoff, Gullstrand, Fuchs, Wolff, Krueckmann and Schoenemann were of the same opinion.

M. Salzmann, Wien: The chorioidal changes in high myopia. S. attributes them to mechanical causes.

W. Uhthoff, Breslau: On changes in the optic nerve in fractures of the skull, especially hematoma of the optic sheath. Two cases of fracture of the skull with effusion of blood into the optic nerve propagated from the subdural space of the cranial cavity, and presenting the ophthalmoscopic aspect of papillitis.

F. Dimmer, Graz: On photography of the fundus; with plates. The new apparatus of D. gives greatly improved photographs of the fundus, principally by excluding the disturbing reflexes of the cornea and lens.

A. Vossius, Giessen. On siderosis bulbi. V. calls attention to the following new observations: 1. The possibility that the

siderotic discoloration of the iris may subside, while, on anatomical examination, the iris may still contain iron abundantly. 2. Mydriasis in the first year after injury besides siderosis of iris, perhaps from chemical irritation of the dilator. 3. Spontaneous discolora- of lens, probably degeneration of the vitreous and zonular fibres.

E. Hummelsheim, Bonn: On monocular diplopia in astigmatism.

K. Grunert. Tübingen The lymph channels of the lids. The lymph channels of the inner half of the skin of the lids run on the nasal side of the cheek to two submaxillary lymphatic glands, those of the outer half run to the temporal side to three so-called parotid lymphatic glands.

St. Bernheimer, Innsbruck: Remarks on tobacco and alcohol amblyopia and on reflex nystagmus. B. noticed in the early stages marked redness and opacity of the temporal half of the disc. The outlines are not sharply defined and the reflex streaks of the vessels do not show the normal lustre and clearness. In testing the visual field with red discs of 1–2 mm. diameter he always found a relative or absolute scotoma for red. These observations confirm the view of those who consider intoxication amblyopia as a primary (partial) interstitial optic neuritis. B. observed nystagmus in uncorrected hypermetropia, in consequence of over-exertion in near work, and explains it as an irradiation of irritation from the center of accommodation to the other nuclei of the oculomotor nerve, and in catarrhus siccus, as irradiation from the nucleus of the 5th nerve to the oculomotor centers.

P. Roemer: On the action of iodoform in intraocular infections. Iodoform acts, without doubt, favorably in infections, due to the common pus cocci, as illustrated by two cases. It was unsuccessful in a case of infection by bacilli which resembled hay bacilli.

C. Emanuel, Leipzig: On the relation of tumors of the optic nerve to elephantiasis neuromatodes.

Two sessions were devoted to demonstrations of specimens, apparatus and instruments. C. ZIMMERMANN.

Studies on the Cortex of the Human Brain.

S. Ramon y Cajal, Prof. Dr. Translated by Dr. J. Bresler, Freiburg, i. S. No. 1. The visual cortex, 3 M., 75 cents. No. 2. The motor cortex, 4.50 M., $1.15. No. 4. The acustic cortex, 3 M., 75 cents. Leipzig, 1901-1902. Joh. Ambr. Barth.

Our knowledge of the structure of the cerebral cortex of man and the higher animals is still very small and limited to the very coarse morphology of the body of the neurons. The aim of Cajal's work is the anatomical investigation of the minute morphology, the situation and connection of the cell processus, by the methods of Nissl, Weigert-Pal, Ehrlich, Cox and Golgi. C. found in the visual cortex and the other cortical regions common structures which are scarcely, or not at all, modified in spite of the localized functions and corresponding anatomical adaptations, and asserts that this common

anatomic substratum exerts the same function in the whole cortex. On the other hand, not only the visual cortex, but also the remaining sensory spheres of the cortex, show peculiarities, by which they may be recognized at once in good chrome-silver preparations. Thus the strata of the small and large star cells represent the chief termination of the optic fibers in the visual cortex, from which may be concluded that they are the seat of the visual sensations. The acustic cortex is recognized by the existence of large horizontal spindle and triangular cells and by the very delicate fibers in the stratum of granules, while the motor cortex is characterized by the preponderance of the plexiform stratum, the multitude of giant pyramids, etc. The vast abundance of new facts the celebrated author presents in this work render its careful study imperative for all who wish to become familiar with the delicate structure of the brain. Print and the numerous illustrations are excellent.

C. ZIMMERMANN.

Annual Reports on the Progress of Ophthalmology.

Prof. Dr. J. von Michel, Berlin. Jahresbericht ueber die Leistungen and Fortschritte im Gebiete der Ophthalmologie, begründet von Prof. Nagel. Jahrgang 29 und 30. Reports for the years 1898, and 1899. Tuebingen 1901, H. Laupp'sche Buchhandlung. 26 M. $6.50, each.

In the April number of the ANNALS we commended the great advantages of the Jahresbericht for the study of the progress of ophthalmology in each year and its usefulness for ophthalmological authors. From Vol. 29 on, this has been much enhanced by the use of different print. The subjects to be emphasized are displayed by heavier type which aids the reader very much to recognize the important facts at a glance. C. ZIMMERMANN.

Biographic Lexicon of Prominent Physicians of the Nineteenth Century.

Prof. J. Pagel, Berlin. Biographisches Lexicon hervorragender Aerzte des 19 Jahrhunderts. Mit einer historischen Einleitung. Wien and Berlin, Urban and Schwarzenberg, 1900. 28 M. $7.00.

The biographic Lexicon will be welcome to every physician who feels interested in the personality of the prominent members of his profession. It contains as accurate as possible, biographies of physicians who, by literary or scientific practical work, have contributed to the progress of medical science in the 19th century. 669 portraits of the most prominent, render the book more attractive. It is preceded by an introductory review of the most important names and achievements of the past, especially the first third

of the eighteenth century. The book is very handsomely gotten up in every respect, and is a good work to possess.

C. ZIMMERMANN.

The First Decennium of the Eye Department of the State Hospital at Laibach, Austria.

Dr. E. Bock, Primarius. 127 pages with one plate and 6 figures in the text. Wien, J. Safar, 1902.

The author claims as the main value of this interesting report the original observations and experiences of an oculist in a secluded district. After an introductory history of the hospital and statistics, which show that 7637 eye patients were treated in ten years, from 1890 to 1900, and 3232 operations were performed of which 913 were cataract operations, B. records in detail his observations on various eye diseases and their treatment, operations and his experiences with regard to some recent remedies. We thoroughly enjoyed the reading of this excellent work which imparts a great amount of practical and useful information. C. ZIMMERMANN.

On Optic Illusions, Especialiy with Regard to the Form of the Sky and the Relative Size of the Stars.

W. von Zehender, Leipzig. Joh. Ambr. Barth, 1902, 121 pages. 4 M. $1.00.

The Nestor of the living ophthalmologists, Prof. W. von Zehender, re-edited in this monograph his physiological optical essays which first appeared in Vol. 20 and 24 of the Zeitschrift f. Psychologie and Physiology der Sinnesorgane, and thus made them accessible to a larger circle of readers. He enters closely into the study of phenomena known as geometric optical illusions, as the vernier-like sliding of Poggendorf, the magnified appearance of acute angles, etc., and gives new explanations. The second part is devoted to histological reviews and recent observations on the form of the sky and the apparent larger size of the stars on the horizon. The author brings forward quite a number of new points, so that his work will be read with benefit by all who are interested in the physiology of the visual organ. C. ZIMMERMANN.

On the Physiologic Intellectual Inferiority of Woman.

Prof. P. J. Moebius, Leipzig. 4th edition. Halle a. S. Carl Marhold, 1902. 1.50 M. 35 cents.

This essay of the well known neurologist has created quite a sensation, not only in medical circles but also among the laity, so that two years after its first appearance a fourth edition has become necessary. It is enlarged by a preface, two chapters of additional remarks and an appendix of criticisms, favorable as well as adverse. M. treats his subject in two respects, in as much as woman is not only less gifted with mental faculties than man, but also loses them more quickly than he does. If M. speaks of intellectual inferiority he means it in a relative sense, i. e., compared with individuals of the same age, sex and race. At first the anatomic difference is shown, viz.: that very important parts of the brain are less devel-

oped in woman than in man, Instinct plays a greater part in woman than in man, and makes the former more dependent. All progress starts from man, etc. The chief task allotted to woman is maternity. And with this view the author urges the physicians to study the conditions of the brain and intellect of woman and to understand their inferiority, to do all in their power to combat, in the interest of the human race, the unnatural aspirations of the "feminists." As M.'s work is of great general interest we recommend its study to our readers.

C. ZIMMERMANN.

The Optician's Manual.

Brown, C. H. (Vol. II, Chapters 11-14, inclusive. A treatise on the Science and Practice of Optics compiled from the serial written by Dr. C. H. Brown, Graduate University of Pennsylvania; Prof. of Optics and Refraction; Formerly Physician of the Philadelphia Hospital; Member Philadelphia Co., Pennsylvania State and American Medical Societies. Published exclusively in the Keystone, the Organ of the Jewelry and Optical Trades. With illustrations. 403 pp. Price $2.00.)

Volume I, of this publication, was reviewed in September, 1899, ANNALS OF OPHTHALMOLOGY, Vol. VIII, p. 637. Vol. II completes the subject by describing hypermetropia, myopia, astigmatism and anomalies of the ocular muscles with their complications and the means of optical correction, with hints at medicinal and surgical treatment of such cases that the optician is not advised to treat but rather to send to the physician. The work is written in colloquial style and is up to the understanding of opticians who may have received a fairly good education. It is a text-book compilation without direct references, especially the writings of Landolt, Risley, Burnett, Stevens, Savage and Jackson and others. Vol. II. is not of such great an interest to ophthalmic surgeons as Vol. I in which a good many points about the manufacture and fitting of lenses and spectacle frames was given. The two volumes together furnish a good review of the subject written in popular style that will appeal to the tradesman and to some physicians. The constant conjunction of the words "optician" and "patient" is an incongruous performance. If the word "patient" be used, it necessarily conveys the idea of treatment and perusal of both these volumes leads the reader to infer that proper understanding of the subject may only be acquired by a special education, not along the lines of the optical trade, but also for a physician. Were these two books written for the medical profession, boiled down and condensed into one volume, the work would be well worthy of commendation from a scientific standpoint. Its colloquial style, however, leads the author to the use of too many words and faulty English. It is recommended to those who do not wish to go deeper into the subject in the manner of Landolt, Donders and Tscherning, et al.

H. V. WÜRDEMANN.

Newer Ophthalmic Remedies.

Ohlemann, Dr. M. (Augenarzt in Wiesbaden, Kgl. Preuss. Kreiswundarzt, A. D., Die Neueren Augenheilmittel für Aerzte und Studierende, Verlag von J. F. Bergmann, Wiesbaden. 1902. Price, M 3.80. 90 cents.

It is with much pleasure that I welcome the advent of this most ably compiled and edited work upon the Newer Ophthalmic Remedies. The book fills a niche made for it during the last five years by the very radical change of medicinal treatment for many diseases that has occurred. So many new remedies as well as new methods, such as instrumental massage, the use of various forms of electricity, organo-therapy, serum-therapy, light-therapy, have likewise arisen. The book will prove of great interest to the progressive members of the profession and we hope for a translation into English as was done for the author's previous work upon Ophthalmic Remedies. The reference to authors and the index are very complete. H. V. WÜRDEMANN.

The Diagnosis of Nervous and Mental Diseases.

H. T. Pershing. Philadelphia. P. Plakiston's Son & Co. 1901. 12 V.—$1.25.

The object of this small volume is stated in the preface: "To facilitate the recognition of nervous and mental diseases by physicians who are not specialists in neurology." In this the author has succeeded admirably and the fact that the eye-symptoms have been treated with special thoroughness—as their importance in neurologic diagnosis demands—makes the book one which will be of great value to the ophthalmologist. Pershing has given us a set of diagnostic rules—largely in the form of tables—illustrated by the most serviceable drawings he could find in literature. Very rare phenomena have at times been omitted—probably intentionally, for they would be of interest to the specialist only. It would hardly be possible to give in a more concise form so complete an aid to neurologic diagnosis. S. KUH.

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A STUDY OF THE CONNECTIVE TISSUE OF THE ORBIT BY A NEW METHOD.*

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ILLUSTRATED.

I.—OBJECT. 1. The object of this study is to ascertain more exactly the location of connective tissue bands in the orbit, with their relation to strabismus and operations for its correction. It is the universal experience of ophthalmologists, that tenotomy of the recti muscles is one of the simplest and safest of all operations, while it is also one of the most difficult in which to obtain entirely satisfactory results, and that advancement, though more difficult, is still more unsatisfactory. Another well established fact is, that these results depend largely upon the extent to which the connective tissue which is attached to the muscle near its insertion and to the adjacent tissues, is divided. Finally, it is certain that there is some confusion of names and statements in regard to that coarser portion of the connective tissue which has been already seen and described, and we are thus far entirely ignorant of the finer fibers which sometimes are of decided clinical importance. In other words, our lack of knowledge concerning the connective tissue in the orbit is to a considerable extent the cause of the disappointing results which frequently follow operations on the recti muscles.

*Prize essay, 1902, Medical Society of New York—Legacy of Dr. Merrit H. Cash.

2. The fascia and even finer bands are of clinical importance in relation to accumulation of fluid, or the extension of morbid growths within the orbit, or in the protection which they give from injuries or from bacterial invasions from without.

3. They are also of interest with reference to the normal motions of the globe.

4. It is an advance to add even a single new fact to the sum of medical knowledge without reference to any practical bearing which it may have at the time. For such reasons it seems worth while to call attention to these structures, especially as they have not been studied before in the manner which will be here described.

II.—EARLIER LITERATURE. PRESENT CONFUSION AND LACK OF ACCURATE DETAILS.

In order to understand the subject before us, it will tend to clearness of statement and economy of time, if we glance at the first description of these parts and note the confusion that has followed as the result of ordinary methods of dissection. Nearly one hundred years ago, M. Tenon, member of the institute, completed a quaint little volume of "Memoirs and Observations," which was "published by the widow Madame Nyon." In this series of articles on different surgical subjects, there is one of "Anatomical Observations on the Eye and the Eyelid, which was read at the Institute on the twenty-ninth Fructidor, in the year 13." He then described what he called "A New Tunic of the Eye," and although the account was short and imperfect and has led to much confusion, nevertheless, that communication has made the name of the writer better known among ophthalmic surgeons of to-day than it was probably among all surgeons at that time. Tenon then described briefly the sheath of connective tissue which covers the optic nerve and the globe, as now known to every student. He observed that the tunic was pierced by the tendons of the muscles, and mentioned that, near the insertion of the external and internal recti, fibers are given off toward the edges of the orbit and toward the lids. In a word, Tenon was probably the first to dissect out and describe these connective tissue coverings of

the nerve and of the globe with their important extensions, though, of course, he had no conception of their very practical relation to strabismus or to operations for its correction.

It is unnecessary in this paper, even if it were possible, to trace the literature concerning this subject, as its importance was more and more appreciated, though it is well to point out the confusion of statements concerning it. For, when we seek a description of the connective tissue in the orbit, we find it usually under the term "Capsule of Tenon" and it includes, often, portions which Tenon did not mention and apparently did not know. Moreover, whether we read that description as given in any one of the general textbooks, or in one of the monographs, more or less complete, we are struck by one fact. This is, that while there is a general agreement in all that pertains to those coarser fascia and bands most readily dissected out, and therefore most easily described, on the other hand, there are omissions and contradictions in regard to the finer fibers—and the confusion seems to grow greater in proportion as the tissue under consideration becomes more delicate and difficult of demonstration.

Schwalbe* says, "We find a most decided difference in the literature concerning the extent of Tenon's space and the relation between Tenon's fascia and other fascia of the globe." Thus Bonnet's description does not accord entirely with that of Budge, and although the latter's arrangement was followed closely by Motais, still these two differ, especially as to the arrangement anteriorily, and neither agrees entirely with what is found in the article by Merkel and Kallius in the portion of Graefe-Saemisch which appeared a few months ago. Moreover, we have thus far no representations by photography of the connective tissue in the orbit, but only drawings and diagrams—some of these, as we shall see, being far from accurate.

Now, it is not strange that there should exist confusion among anatomists when we remember that probably no two of them have made exactly the same dissection of the connective tissue of the orbit. For it must be borne in

*Schwalbe. Archiv fur Mikroskopische Anatomie, 1870, page 1.

mind that it is out of the question, with the naked eye, to recognize these fibers with absolute certainty, and even with a dissecting microscope, the difficulty amounts sometimes to an impossibility. But on the other hand, every ophthalmic surgeon knows that these delicate fibers are often of considerable clinical importance, especially those near the insertion of the recti muscles. For example, it is a frequent experience, when making a tenotomy for convergent strabismus, to divide, as we suppose, the entire tendon with all its attachments, but as we remove the speculum, to observe the position of the globe, we find a considerable degree of convergence remaining. Then, replacing the speculum, only one or two minute fibers in addition are divided, or perhaps the hook is simply swept a trifle deeper through the wound, when immediately we see the convergence disappear, and the eye swings into the position desired.

To summarize this portion, therefore, we find, that the term Capsule of Tenon is by no means exact, much confusion existing as to its extent; that this confusion is largely the result of difficulties in recognizing the more delicate fibers by ordinary dissection, but, that these fibers are of unquestioned clinical importance.

III.—MORE RECENT AND BETTER METHODS OF STUDYING CONNECTIVE TISSUE.

It happens that very recently new methods have been discovered for identifying connective tissue fibers, and a careful search through Nagel's Jahresbericht fails to show that any one has yet made use of these to study the fascia or bands in the orbit. Nor is this strange, considering how short a time has elapsed since they were discovered, especially the two most useful. The earliest dates back only to 1894. Van Giesen published his method in 1896, Mallory in 1900, and the third, which has been used in this study and which will be described later, is given in this article for the first time.

No account is necessary, of course, of methods already published, but as many trials and repeated failures in this new field have taught the writer some important lessons in technique, it may prove useful to others, to refer briefly to them. The special points are:

(a) *Concerning the dissection of the orbit.* When the walls of the orbit and its contents have been removed, care should be taken to saw down the outer shell of bone as thin as possible. The thicker that is, the longer the specimen must remain in the decalcifying acid, the more brittle the soft parts become, and the more difficult is it to obtain good sections or well-defined stains.

(b) *Fixing solution.* For most methods of staining, the specimen should first be hardened in Zenker's fluid. The results with other solutions often recommended, have not been found satisfactory. Nor is it sufficient to leave the specimen, as ordinarily, only a day or so in the Zenker. It is better if hardened three or four times as long, and it is easy to wash out any excess of mercury by means of the Grams solution of potassium iodid, though, after being so long in the fixation solution, a more thorough washing, of course, is necessary before the water runs clear.

(c) *Decalcification.* The solutions ordinarily used for this purpose are too strong. Thus the twenty per cent. solution of nitric acid, recommended by so high an authority as Birch and Hirschfeld, has been found ruinous to the finer fibers when they were left in it a long time. Even the five per cent. solution of hydrochloric acid, advised by Motais, renders the soft parts brittle when in the alcohol, and two and a half or three per cent. solution of the acid has been found to give better results. A still better method is, after fixing in the Zenker, to wash in water and then, wrapping a piece of absorbent cotton carefully around the bone, keep the cotton moist with twenty per cent. hydrochloric acid. In this way the acid acts on the bone alone, with little or no injury to the soft parts. It should be remembered, however, that while decalcification is well enough for the sake of completeness, it is not essential, for after a little experience it is easy to recognize the bands of connective tissue, which at first appeared meaningless, even when the fibers stretch off toward the periosteum and end there without any bony attachment.

(d) *Stains for connective tissue and reticulum, heretofore described.* These need only to be mentioned, although, as before stated, they are all recent discoveries. The list is not long. We have: Unna's orcein stain; Van Gieson's picro-fuchsin stain; Mall's differential method for

reticulum; Ribbert's phosphomolybdic-acid hematoxylin; Mallory's phosphomolybdic-acid aniline blue. Of these methods, the second has been found the simplest and most reliable. It does not stain the very finest fibers as well as the Mallory, but all that are of importance, probably, to the clinician.

IV.—AN ADDITIONAL METHOD FOR STAINING CONNECTIVE TISSUE.

It was suggested to the writer, by Mr. C. A. Bentz, that connective tissue could be rendered susceptible to the usual stains, by first treating it with potassium permanganate and then bleaching with oxalic acid. That was found to be the case, and due acknowledgement is accordingly made. It has been necessary, however, to try solutions of various strenghths for different lenghths of time in order to formulate even the outline of a method, or arrive at any conclusion as to its value. For the purpose before us, it may be described as follows: After fixing in Zenker, hardening in alcohol, cutting as usual and removing excess of mercury with Gram's solution, if necessary, then: first, wash in water; second, place in one per cent. solution of potassium permanganate one to three minutes; third, wash in two or three changes of running water; fourth, place in one and one-half per cent. solution of oxalic acid four to six minutes, or until the dark brown has faded; fifth, wash as before; sixth, stain in one-fourth of one per cent. aqueous solution of acid fuchsin a minute or more; seventh, wash as before; eighth, stain in one-third of one per cent. solution of anilin blue, one to three minutes, or until the fibers or thoroughly colored; ninth, wash as before; tenth, alcohol-xylol-balsam.

While this method is similar to that of Mallory, it has decided advantages.

The phosphomolybdic acid is done away with, and it is unnecessary, therefore, to use only glass rods or platinum needles. The plan is simple, rapid, economical, and the results quite as good or better, for the present purpose, at least, than those obtained by any other method.

V.—THE RESULTS OF THIS STUDY.

It is necessary to state at the outset a conclusion drawn

simply from an examination of the literature of this subject. It is that the term Capsule of Tenon should not be used in its present general sense, including various extensions of connective tissue, but should be restricted to that portion which covers the optic nerve and the globe itself.

With this understanding, it appears partly from foregoing descriptions, and especially from the stains referred to, that the fascia and connective tissue of the orbit can be divided into at least four groups. It will be convenient to consider each of these in order.

(a) Capsule of Tenon. This, we should understand as the name of the well known sheath which, commencing at the optic foramen, extends forward, surrounding the optic nerve and covering the globe of the eye as far as the insertion of the recti muscles, or even beyond that point. Externally it is covered by fat, except anteriorly, where the muscles lie directly upon it. By its inner surface, it is connected with the nerve and the globe by means of a delicate net work of fibers. This space has been so carefully studied and described by Schwalbe that but little remains to be said cencerning it. He has shown by injection and otherwise, that it is filled with a net work of lymphatics, the clinical importance of which, especially in the possibility of transmitting bacteria from one eye to the other, need only be mentioned to be appreciated.

The space that surrounds the optic nerve is much larger than that which exists between the globe and its capsule. This feature is particularly striking, as will be seen by an examination of transverse sections of the nerve, and is a point which apparently has not been mentioned.

In the earlier literature there is much confusion as to whether or not the space around the globe is continuous with that around the nerve, but stained sections apparently confirm the view of Schwalbe, that while the capsule is contracted at the entrance of the nerve to the globe it still remains open there.

The anterior portion of the Capsule of Tenon is of special interest in relation to the operation for strabismus. The important question that arises is, how far anteriorly does the capsule extend. In regard to this point there was much confusion, as already indicated, and this is not

surprising when we remember the absence of accurate methods of study. Staining, however, shows beyond question that the capsule proper does extend beyond the line of insertion of the recti.

(b) Connective tissue extensions from the recti. The recti and the superior oblique, near their origins, have only a very thin covering of connective tissue, but as they come forward their sheaths become thicker and give off fibers in various directions.



Fig. 1. Ocular surface of the internal rectus showing connective tissue fibers. (Secondary attachment) between muscle and globe.

The stained sections indicate that the actual insertion of the recti is not always by one small tendon along a single line. Although that may occur, we also find fibers of connective tissue which pass off from the muscles, to be inserted into the capsule considerably posterior to the point at which the main tendon is attached. At first these sections caused considerable surprise, but I found that this variation, with others, had already been recognized by Weiss. As he, like the others, used only ordinary meth-

ods of dissection, the number of these fibers found and their extent was probably by no means as striking as by the method here described.

We are all familiar, of course, with the fact that some connective tissue fibers do join the muscles to the capsule, but it is not generally appreciated that these are sufficient, in some cases, at least, to constitute a really considerable extension of the attachment. The clinical importance of this arrangement, by which the attachment of a muscle becomes in reality quite extended from before backward, or has what may be called secondary attachments, is easily seen and needs no elaboration.

In addition to these fibers, connecting the muscles to the capsule, others should be mentioned which extend outward toward the edge of the orbit, most of which form part of the check ligaments. Still other fibers pass from the outer part of the muscles to adjacent soft parts, as from the inner border of the superior rectus and upper border of the internal rectus toward the tendon of the superior oblique; in a word, from each of the muscles to adjacent parts.

(c) Aponeurosis or fascia orbito-ocularis. This term was used rather vaguely by some of the earlier writers to include not only the Capsule of Tenon proper, but also those bands of fasciae which stretch off toward the edge of the orbit. It is much better to restrict that name to portions which it really describes. For such an aponeurosis, or more exactly, such a fascia, has long been known, only its limits have not been as yet well defined. The fibers form a curtain attached to the edges of the orbit, and pierced by the globe, which protrudes, as it were, part way through the curtains considerably above and a little to the outer side of its center. As the fibers of this fascia pass from the capsule, or from the muscles near the globe, they are attached to the edge of the orbit around the entire circumference. In certain parts, the fibers are so thickened and reinforced by others from adjacent structures that their character is altered, their function becomes especially important, and therefore some of those portions have received special names. The thickened portion toward the median line has been called the internal check ligament, and that on the outer side the ex-

ternal check ligament. But a study of sections in which the connective tissue has been stained indicates that we may also speak with propriety of a superior and inferior check ligament.

Let us consider these ligaments in order. They are:

(a) The internal check ligament. This is a firm band of fascia, formed of connective tissue, which passes from the capsule of Tenon to be inserted along the line of the



Fig. 2. Outer portion of external rectus. The aponeurosis orbito ocularis is seen by reflected light with a fold of connective tissue passing from the external surface of the muscle to the margin of the orbit.

crista lacrimalis posterior. This fascia is also strengthened by some fibers which are given off from the internal rectus, by others which curve upward from the inferior oblique and still others from above, near the pulley of the superior oblique, where fibers are also blended which come from the superior rectus or even from the levator.

The internal check ligament when viewed in front, is roughly quadrilateral in form. The base, which is ill-defined above and below, is attached into the crista lac-

rimalis posterior for a centimeter or more, and also into the wall of the orbit just posterior to this line. The outer edge of the ligament is attached to the inner surface of the internal rectus and to the adjacent portion of the Capsule of Tenon. Its upper and lower edges shade off, by imperceptible gradation, into the corresponding parts of the general aponeurosis or fascia orbito-ocularis.

The center of the insertion of this internal check ligament is not opposite the center of the cornea, nor on a line with the center of the internal rectus, but considerably below both, as the upper edge of that insertion does not reach, on the crista, much above the fronto-lacrimal suture.

Moreover, the anterior surface of this ligament, at its attachment to the crista, is not in direct contact with the posterior wall of the lacrimal canal, but is separated from it by a space of two or three millimeters of loose connective tissue fibers. The clinical importance of this is evident in connection with the introduction of lacrimal probes.

It will be noticed that the form of the ligament as thus described, differs somewhat from the "schema," which is figured in the article by Merkle and Kallius in the second edition of Graefe-Saemisch, which has just appeared. When horizontal sections are examined, it will be seen that the fibers of this ligament pass from their bony origin forward and then curve backward to be attached to, or intertwine with others which come from the inner surface of the internal rectus. Thus the ligament may be said to have a thickness from above backward of three or four millimeters near the bone and six or eight, or even greater thickness, near the muscle, if we take into account also the fibers, which are more or less separated from each other. There are several other points connected with the structure, and especially with the action of this ligament, which are of interest in connection with operations for strabismus, but which it would be out of place to consider in the present connection.

(b) External check ligaments. Let us consider next the thickened portion of this fascia orbito-ocularis, which has been called the external check ligament.

This is made up of firm bands which connect the outer portion of the Capsule of Tenon with the outer and upper edge of the orbit. Like the ligament of the inner side, its limits are not well defined, as it passes, by imperceptible gradations, into the other portions of the fascia, both above and below.

Like the internal ligament, this external one is somewhat quadrilateral in form from above downward. The outer edge, five or six millimeters from above downward, is attached to the outer margin of the orbit just below the zygomatic suture.



Fig. 3. The connective tissue of the aponeurosis orbito-ocularis extended as in figure 2 and viewed by transmitted light. This illumination is produced by placing an electric light behind the connective tissue bands.

A more exact examination of this shows that it is formed of fibers of fascia derived from different sources; the upper portion comes from the lateral fibers of the levator palpebrae, for it must be remembered that this muscle does not pass directly forward to be inserted in the upper margin of the cartilage, but that fibers sweep outward, some in fact backward and downward over the lacrimal gland, and there, blending with other fibers, form a portion of this external check ligament which we are now considering.

This external check ligament is also strenghtened by fibers of connective tissue given off from the outer margin

of the superior rectus and by fibers from the upper margin of the rectus externus. It is a firm, well marked band, and is a strong support in holding the eye in its position.

It will be observed that the staining of the connective tissue gives results as regards these portions, especially of the connective tissue, which are quite different from those obtained with ordinary dissections by Motais and other still earlier writers. They do accord, however, more nearly with the very recent descriptions already referred to by Merkel and Kallius.

(c) Inferior check ligaments. A third portion of this fascia orbito-ocularis deserves special attention. As the



Fig. 4. Connective tissue of the aponeurosis orbito-ocularis. Lighted from behind and viewed in the same manner, as before. Connective tissue fibers are relaxed by allowing the globe to approach nearer the edge of the orbit.

connective tissue fibers join to form a thin ligamentous band, and as it also checks the motion of the globe within certain limits, it may, with propriety, be called the inferior check ligament.

The thickened fibers here do not pass directly outward toward the margin of the orbit, as is the case on the inner and outer side of the globe. Their general direction is more in the line of the inferior oblique, or, indeed, they curve around with the concavity upward in such a manner as to deserve partially the term given to them by Lockwood. He groups them together under the term ligamentum suspensorium oculi. It is true, their apparent function is partly expressed by this term. But it is also true,

that when they are divided below near the globe much greater upward rotation is possible than before.

(d) Superior check ligament. Finally, a fourth portion of this fascia deserves a word. Although much less marked than the other thickened portions it is, in a certain sense, a ligament; it does also prevent excessive down-



Fig. 5. The vertical section of levator palpebrae and superior rectus showing secondary attachments of the latter.

ward rotation, and for the sake of completeness, at least, deserves the name of the superior check ligament.

It is situated immediately below the upper part of the orbit, and is composed of fibers which come partly from the Capsule of Tenon, from the rectus superior and from the anterior edge of the tendon and of the superior oblique.

It is roughly quadilateral in shape, being four or five millemeters in length above and below, its center corresponding roughly with the center of the superior rectus.



Fig. 6. Vertical section of inferior oblique and inferior rectus showing secondary connective tissue attachments.

(e) Other connective tissue in the orbit. It goes without saying, that the entire orbit is filled with a net work of connective tissue which forms the sustaining structure of the fat, the blood vessels and the nerves. A section in any direction, when stained, shows this net work distinctly. Fibers also pass in an irregular manner from one muscle to another.

An erroneous impression is prevalent in regard to these latter fibers, which it is worth while to refer to. When Motais prepared his monograph, following the description of Budge, he dissected out these fibers deep in the orbit, which pass from one muscle to another, apparently neglecting the others, which ramify through the fat and which indeed are often microscopic. In this way he obtained what Budge had called the "fascia superficialis." The beautifully colored diagram is copied by Maddox, and the description frequently quoted.

But here again the staining method is of value. For it shows in transverse sections not simply the fibers which pass from one muscle to the next, but a net work throughout the entire orbit quite as well marked as there.

CONCLUSIONS.

To such a degree as it is possible to summarize a paper dealing largely with descriptive anatomy, the conclusions may be stated as follows:

1st. Much confusion has existed in regard to the connective tissue of the orbit, this being due to the difficulty in dissecting the finer fibers and to the confusion of terms employed.

2d. By the employment of stains recently discovered, these fibers can be studied with better results than at any time previously.

3d. By the use of potassium permanganate and oxalic acid, we have still another method, and one of the best, for identifying these connective tissue fibers.

4th. With the assistance of these methods, especially the last, an idea is gained of the Capsule of Tenon, of the insertions of the recti, of the check ligaments, and of other connective tissue in the orbit, which in every way is instructive and in some details is new.

Photographs of some of the sections. (All are from the human eye except the last.)

As the object of this whole study is to ascertain more exactly the location and relation of the connective tissue fiber in the orbit, it is, of course, desirable also to represent them accurately, and not by schematic drawings or diagrams as had been done formerly.

This part of the work has been undertaken by Dr. A. E. Hubbard, to whom acknowledgements should be made for his enthusiasm and patience in struggling with the difficulties of photographing shades of color. Unfortunately, it is practically impossible to obtain recognizable pictures of some portions, especially parts of the check ligaments. The fibers there are so dense as to show only indistinct outlines of grey and black in the photograph, while under the microscope the colored lines are easily followed.

It is probable that in the future, when plates more sensitive to colors can be made, more satisfactory results will be obtained. But, in spite of the difficulties of photographing these special stains, it can be said that the pictures, such as they are, at least are the first which we have of the fascia and connective tissue bands in the orbit.

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TOXIC AMBLYOPIA.*

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On pages 170 and 193, Vol. XI, of these Annals, we described briefly, with critical remarks, the experiments of Birch-Hirschfeld on quinin and filicic amblyopia. In the same place we also briefly describe the experimental researches of Rhumowitsch on intoxication by ethylic alcohol and of Ward A. Holden on methylic alcohol. Both of these authors find, as the first and only effect of the intoxication, changes in the nerve cells of the retina. We added that further researches were still necessary in this direction.

Birsch-Hirschfeld has repeated Holden's experiments with methylic alcohol. He enumerates first the published cases of acute amblyopia and amaurosis coming on in man after the ingestion of large quantities of methylic alcohol. These cases are already somewhat numerous; and it would seem even from the present point of view that methylic alcohol is more dangerous than ethylic alcohol. It is also to be noted that some of these methylic amblyopias have presented themselves—at least temporarily—under the form of central scotoma. The clinical symptoms—notably the ophthalmoscopic ones—are, in brief, those of acute ethylic amblyopia. This last point is to be remembered,

**Birsch-Hirschfeld.* Experimental researches on the pathogeny of amblyopia, in Arch. f. Ophthalm., t, 52. pp. 358-384.

Birsch-Hirschfeld. New contribution to the pathogeny of alcoholic amblyopia. Ibid. t, 54, pp. 48-68.

Birsch-Hirschfeld. Pathogeny of chronic nicotine amblyopia. Ibid., t. 53, pp. 79-112.

as also the well established fact that taken over a long period of time in small doses, methylic alcohol can excite in man, an amblyopia identical with that of ethylic alcohol.

In a first experimental work, B. H. described intoxications of this kind in the rabbit and the hen. He describes as the only primary alteration of the visual apparatus chromolysis and vacuolations of the nerve cells. In one of the rabbits he found over a small area a change in a fasciculus of the optic nerve. He concluded, therefore, that the point of attack of the poison is in the retinal nerve cells and that the changes in the nerve are secondary to toxic lesions in the cells.

Let us make the observation now that in none of the animals under experiment could B. H. prove the presence of amaurosis or even of amblyopia and that all died rapidly or were killed in a moribund condition. Some presented a certain amount of dilatation and immobility of the pupil.

In the second work B. H. described identical experiments on dogs and monkeys.

As to the dogs, none of them manifested amaurosis or amblyopia. All died rapidly at the end of several days following ingestion of methylic alcohol into the stomach, some after having shown some dilatation of the pupil. The author does not hesitate, however, to use these animals, and describe as the total alteration in the visual apparatus, chromolysis and vacuolation of a part of the retinal nerve cells.

It was identically the same with a series of monkeys, *except in one* which became evidently blind after the eighth dose of poison and died moreover 11 hours later.

At the autopsy of this blind monkey B. H. found, besides some changes in a part of the retinal nerve cells, a degeneration of certain bundles of the optic nerve most marked near the eye and diminishing from that point backward. This degeneration consisted moreover of destruction of the nerve fibres. The neuroglia was intact, its nuclei were not proliferated, but it was distended by interstitial edema. The connective tissue septa and the vessels were intact.

In his conclusions at the end of this second work, B. H. admits a primary action of the poison on the nerve cells.

Nevertheless, he says the optic neuritis cannot be considered to be a simple secondary degeneration, consecutive to a lesion of the nerve cells; it indicates an injurious influence primarily exerted on the nerve fibres themselves, in the same manner as in the nerve cells. These final conclusions of the author, as to the point of attack of the poison and the nature of the pathological process in the nerve, conform too closely to those which we have formulated ourselves in filicic amblyopia to prevent us from experiencing much satisfaction in the confirmation of them; which also B. H. himself does. We have shown also that from the first in filicic amblyopia the retinal nerve cells and nerve fibres are affected and that the affection of the nerve is a parenchymatous neuritis. The differences between our two descriptions are due to the fact that B. H. has been able to submit to anatomical examination one methylic neuritis only, in an early stage, while our description of filicic amblyobia is based on the examination of twenty dogs, blind or very amblyopic, killed from half a day to three months or more after the onset of the amblyopia.

Let us state also that the lesions of filicic and methylic amblyopia are entirely different from those of quinin amblyopia (Holden). Moreover, the clinical course—identical on the whole for filicic and methylic amblyopia—differs completely from that of quinin amblyopia. It seems then that there may be two forms of affection entirely separate. In quinin amblyopia the changes in the optic nerve have altogether the appearances of secondary degeneration consecutive to the lesions of the nerve cells, in accordance with the results of the concordant researches of Holden, Nuel, Druault and Birsch-Hirschfeld. It is quite otherwise with filicic and methylic neuritis.

This being said, we cannot restrain ourselves from attributing again to B. H. two serious defects in the experimental method employed, defects which we have also pointed out in the experiments of Rhumowitsch on ethylic amblyopia.

In the first place B. H. gives his attention generally in his experiments to such animals as the rabbit in which the visual reactions are so slightly pronounced that one can scarcely tell whether the animal can see or not.

A second serious blemish is that without exception the author works with doses which soon lead to death so that the anatomical specimens are taken from animals either dead or in death agony, and dying of an acute malady. This is the situation with B. H's. experiments on rabbits and hens, as well as with those on dogs and monkeys, with one single exception—that of the monkey which became blind. Ward A. Holden in his work on methylic alcohol makes use also of a dying dog, neither blind nor manifestly amblyopic.

It will be admitted that some dilatation and paresis of the pupil in a moribund animal proves absolutely nothing as to the existence of amblyopia or amaurosis. There is no proof that the animal would have become blind if it had survived.

In order to put the finger on the errors to which we are exposed in proceeding in this manner, let us recall the fact that in an earlier work B. H. points out as an unique lesion of filicic amblyopia the chromolysis of the nerve cells (internal granular layer) of the retina, and that precisely because he has experimented on the rabbit. He ignores the fact entirely, that every time there is a real filicic amblyopia, there is a parenchymatous neuritis. Similarly also the only animal made blind by B. H. by the administration of methylic alcohol prosented the same parenchymatous neuritis. It would seem then that the only logical conclusion to draw from these facts is that the amblyopia is due to the neuritis.

B. H. himself has shown that chromolysis of the retinal nerve cells is produced under the influence of most diverse pathological causes, which moreover are incapable of exciting amblyopia or amaurosis. Are we not also justified in raising the question as to whether the cell changes, so early in methylic amblyopia (as also those of filicic amblyopia), are not rather the result of the general pathological condition (fever, agony, etc.)? For all B. H's. animals died of acute intoxication. These changes in the cells have possibly no direct connection with the intoxication, and would have disappeared without leaving any trace if the animal had lived. At least the author should be able to demonstrate that under the condition of these

experiments the retinal cells are the only nerve cells in the body showing chromolysis.

The successive works of B. H. tend to show that in the toxic amblyopias the retinal nerve cells are first affected by the poison. Now, as they are presented to us, B. H's. experiments are of such a nature as to make us doubt the importance of chromolysis in filicic amblyopia, for, according to these experiments, an intoxication of a slightly serious degree only, always produces chromolysis, whilst (according to B. H's. and our own experiments) amblyopia is infinitely more difficult to obtain and is always accompanied by parenchymatous optic neuritis.

Our conclusion is, that in spite of the work of B. H., there still remains much to be done before the part that changes in the nerve cells play in filicic and methylic amblyopia is elucidated.

Let us notice also a contradiction in B. H's. successive works on methylic amblyopia. In his first work on the hen and rabbit, he concludes that the changes in the nerve cells constitute the sole and unique lesion from the onset of methylic amblyopia. Later, after having produced in a monkey a true methylic amblyopia, he admits a primary neuritis, simultaneously with the retinal chromolysis. The author ought to have explained the contradiction. For it is, indeed, hardly probable that the process differs in different species of animals. But he would have been led to doubt all his experiments in which the animals had not become manifestly amblyopic; that is to say, to reject them all except those on the blind monkey.

B. H's. ideas on methylic amblyopia seem to have undergone an evolution analogous to that of our own opinion on filicic amblyopia. We also believed at first that the changes in the retinal nerve cells constituted the primary and only lesion in filicic amblyopia. But the falsity of this opinion was demonstrated to us by our own researches. We had therefore nothing to do but state formally the change which had taken place in our way of thinking.

Let us come then to the third work of B. H., explaining anatomically a case of typical nicotine amblyopia in man.

As enucleation could be done a few hours after death, the author was fortunate enough to be able to subject the retina to the Nissl staining process. He first confirmed

the very marked diminution of the macular nerve cells. As a new fact he found that some of the remaining cells were absolutely normal, even as regards the granules of Nissl. Moreover, he found that a part of the nerve cells at the periphery of the retina were changed. As to the changes in the macular fasciculus in the optic nerve, B. H. finds that the neuroglia is a little condensed and that the connective tissue septa are more or less thickened. But nowhere does he find signs of true inflammation.

He cannot see in it the result of an interstitial neuritis, but thinks that the alterations in the nerve fibres are the primary lesions; those of the interstitial tissues being consecutive to those of the nerve fibres. In fact, a parenchymatous neuritis, in conformity with our ideas.

But is this parenchymatous neuritis of retinal origin (secondary degeneration) or is it due to an influence exerted by the poison on the nerve fibres themselves? Taking into account the experimental facts brought to light on filicic (Nuel) and methylic (B. H.) amblyopia, B. H. admits that in chronic alcohol-nicotin amblyopia the poison exerts its deleterious action both on the nerve fibres and the cells from which they originate. The form of the amblyopia (central scotoma) shows that the retina must be implicated from the onset of the affection; this form cannot in fact be explained on the hypothesis that the first and only lesion is in the nerve.

These conclusions concerning alcohol-nicotin amblyopia agree absolutely with those we ourselves have formulated. We have laid stress (p. 193, Vol. XI of these Annals) upon the clinical similarity between acute ethylic amblyopia and filicic amblyopia and we have come to the conclusion from it that in the first also it must originate as a parenchymatous neuritis. This supposition has been demonstrated to be true concerning acute methylic amblyopia by B. H's. blind monkey. Now, no one can seriously doubt that the lesion of acute ethylic amblyopia is identical with that of acute methylic amblyopia; that is to say, that it is a question of a parenchymatous neuritis. Finally, it will scarcely be admitted that the pathological process of chronic intoxication differs essentially from that of the acute form. Consequently we must assume a primary lesion of the nerve fibres in the first also bringing

about subsequent changes in the interstitial tissues of the nerve.

B. H. is, therefore, committed, as we are, to a double origin (nerve and retina) of the morbid process of alcohol-nicotin amblyopia. It is a conclusion which is somewhat repugnant to our preference for simple explanations. But we are inevitably led to it by a conscientious examination of the facts. As for explaining the more exact connection between the two primary processes, that is an undertaking scarcely capable of accomplishment at the present time. We continue to attribute a greater vulnerability to the macular elements resulting from their greater functional activity. If it is true that in some respects the functional activity of the macula is more intense than that of the periphery of the retina, we question if that of a macular *element* is more intense than that of a peripheral element save under exceptional conditions; e. g., in reading. Now we do not know that the educated are more subject to central scotoma than the illiterate.

The fact that such marked amelioration occurs in alcohol-nicotin amblyopia is still put forward as an argument against the parenchymatous nature of the affection. This improvement, it is argued, would be impossible if the nerve fibres were damaged, but would be comprehensible if the amblyopia were due to pressure on the nerve fibres by the swollen connective tissue. To this objection we reply that a very marked filicic amblyopia can recover completely, and yet in this case it is a question of a typical parenchymatous neuritis.

AN ANALYSIS OF 100 CASES OF REFRACTION. WITH SPECIAL REFERENCE TO HEADACHE.*

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When I began the following paper, I intended to take up my last 500 cases of refraction without disease of the eye, but I soon found that the undertaking was one to which I could not devote adequate time and I had to content myself with my last 100. This number is, however, quite large enough to give a trustworthy indication of the conditions to be discussed, if not to afford absolute proof on any special point. I think it may be interesting, particularly to those members of the association who have little personal experience in eye work, to hear how very slight may be the abnormality in the shape, and how perfect the vision, of eyes which are yet responsible for great discomfort and even pain, sufficient to interfere with the patient's success in his pursuits.

The cases are all recent and all white people. 38 per cent. of them are from places outside Atlanta, but all in the Southern States, including Alabama, Florida, South Carolina, Louisiana and Kentucky; as regards *sex* 51 were males, and the average age was 32 1/3 years, but varied from 10 to 72 years.

Their *complaints* were one or more of the following: headaches, defects of vision, inflammation, smarting or burning of the eyes, styes, spots before the eyes, etc.

Of these we shall dismiss all except the headaches by saying that errors of refraction are a frequent cause of them.

Forty-nine or practically half of the patients made a complaint of troublesome headache, almost invariably in-

*Read before the Georgia State Medical Association at Savannah, April, 1902.

creased, if not produced, by use of the eye. In 32 of these the headache was the prime reason for the consultation. The *position* of the pain was frontal in 34 per cent. of the headache cases; and, in 13 per cent. more, spread from the brow to the temples, vertex or occiput; in 18 per cent. the position was not stated; and in the remainder it affected various parts of the head, most frequently the temples, but also the vertex and the occiput.

I am unable to say precisely in what proportion of these cases cure of the headache resulted from the use of glasses, because I have not had the opportunity of seeing many of them at a later date; but, from those cases which I did follow, and from past experience, I believe I am fully justified in saying that in a very large proportion, the headache ceased with the wearing of the glasses. The more constant their use, the better the result as a rule, though not infrequently use for near work alone suffices.

In association with such headaches as are curable by glasses, are either errors of refraction or imbalance of the external ocular muscles whose duty it is to keep the axis of the two eyes directed upon exactly the same spot, or of both. Among 100 cases there was sufficient defect of muscular balance to be a possible cause of headache in 7; of these 7, 4 complained of headache; and 3 of these 4 had a slight deviation outward, associated with myopia. The frequency of the various forms of refractive error, that is, practically of abnormal shape of the eye itself, to which headaches from among these 100 cases may be ascribed, is the following:

Of 43 cases of pronounced headache 29 or 67 1/2 per cent. were associated with hypermetropic astigmatism; 8 or 18 1/2 per cent. were associated with myopic astigmatism; 4 or 9 per cent. were associated with simple hypermetropia; 0 were associated with simple myopia.

Of the 4 cases in which there was mixed astigmatism only one complained especially of (frontal) headache, though discomfort in the eye was general.

And in two cases there were no errors of refraction, one being a rheumatic headache, dependent entirely upon changes in the weather, and the other pain possibly of a similar origin, diffused all over the head.

To put it in another form:

There were, taking the average of the two eyes, among the 100 cases: 45 of hypermetropic astigmatism among which were 29 cases of headache or 64 1/2 per cent.; 21 of myopic astigmatism among which were 8 cases of headache or 38 per cent.; 18 of simple hypermetropia among which were 4 cases of headache or 22 per cent.; 7 of simple myopia among which were no cases of headache.

These figures point to astigmatism as strongly predisposing to headache, and to hypermetropic astigmatism, in which the muscle of accommodation is most called into play, as being not only the most frequent, but also the most powerful of the refractive errors in this connection. Hypermetropic astigmatism appears to have an influence nearly double as powerful as myopic astigmatism, which again has much more influence than simple hypermetropia, while myopia has none at all, so far as these special statistics go. As a result of past observation in many of these cases I should say that myopia has little influence in producing headache, but perhaps an exception should be made in cases which are rapidly progressing. In these, however, the pain has a different origin. The fact that short-sighted eyes so seldom give rise to headache bears out the supposition that the pain in hypermetropic cases is due to the strain upon the muscle of accommodation, because in pure myopia the strain upon this muscle is diminished or absolutely wanting.

On the average in these 100 cases the amount of simple hypermetropic astigmatism is .73 D.; in the cases of compound hypermetropic astigmatism the average amount of the sphere is 1 D. and of the cylinder .39 D.; in the simple myopic astigmatism the average is 1.13 D.; and in the compound myopic astigmatism the average of the sphere is .52 D. and of the cylinder .79 D.; in the mixed astigmatism the average sphere is .59 D. and the cylinder 2.85 D.; in pure hypermetropia the average is .97 D. and in pure myopia the average is .4 D.

It may be interesting to inquire whether the average refractive error is greater in the headache cases than is the general average. We find that in the headache cases the average in simple hypermetropic astigmatism is .50 D.: in compound hypermetropic astigmatism is .57 D. sphere and

.30 D. cylinder; in simple myopic astigmatism is 1.12 D.; in compound myopic astigmatism is .1 D. sphere and .55 D. cylinder; in pure hypermetropic astigmatism is .71 D.

Thus those with headache in simple hypermetropic astigmatism have an average refractive error of only 1/3 the error in the total of these cases; in compound hypermetropic astigmatism the sphere is not much more than half that of the general average, and the cylinder is about the same as that of the general average. In simple myopic astigmatism the headache cases have the same amount as the general average and in compound myopic astigmatism the sphere is nearly double and the cylinder 1/3 less than the general average in pure hypermetopia the error is about 1/4 less than the general average.

The tendency of these figures is to show that the errors of refraction which cause headaches are not necessarily great, and that such headaches may exist in persons with apparently perfect vision. I may add that there may be very little trouble of any kind referred to the eyes themselves. Perhaps the reason that headache is so commonly associated with the low degrees of refractive error is that in these the error is comparatively easily diminished or overcome by the exertion of the ciliary muscle, the eye thereby being encouraged to strain with this end in view.

Out of 28 cases of marked headache in which there was astigmatism, and in which the axis in both eyes was either in the vertical or horizontal quadrant, in 13 the axis was in the horizantal and in 15 in the vertical quadrant. As will be seen later the total number of axis in the two quadants, in all the cases of astigmatism, is almost exactly equal. These figures therefore do not support the assertion which is sometimes made that a horizontal axis is very much more likely to give rise to headache than is a vertical axis.

It may be as well to state that refraction is measured in dioptres, and one dioptre is a small amount of refractive error. A dioptre, is generally divided into fractions .25 D. a quarter dioptre is the smallest glass used by most surgeons, and yet this is one of the most commonly ordered glasses in astigmatic cases. The following are the average errors of refraction in these 100 cases:

	Right.	Left.	Amount. (Right eye used as an example.)
Without error.	5	7	
Hypermetropia.	19	18	.77 D.
Simple hypermetropic astigmatism.	30	27	.73 D.
Compound " "	17	16	sph. 1 D cyl. .39 D.
Myopia.	6	7	4.0 D.
Simple myopic "	10	13	1.13 D.
Compound myopic "	8	9	sph. .52 D cyl. 79 D.
Mixed astigmatism.	5	3	sph. .59 D cyl. 2.85 D.

In 53 per cent. of the cases the patients' eyes were of a different refractive power (anisometropia) the average difference in spheres being .43 D., and in cylinders .35 D. The greatest difference in spheres was 5.D. and in cylinders 2.75 D.

The acuity of vision is measured by a system of differently sized letters, each of which is calculated when seen at the distance for which it is marked, to produce an image always of the same size upon the retina. It has been decided that to see an interval between two objects the images of these two objects must fall upon separate cones in the retina. For this reason each distinguishing part of a letter must be separate from the next word far enough to equal, when seen at the proper distance, an arc subtending an angle of 1′, at the nodal point of the eye, and the whole letter should subtend an arc of 5′.

The largest lettering is usually made to be legible at 60 metres, then next at 36 and so on downward. For testing distant vision the patient generally sits at a distant of six metres (about 20 feet) from the letters, at which distance accommodation is at rest, and from that distance the normal eye should be able to read at least the line marked 6. If it does so the result is put down as 6/6 or 1. Should it read only the letters intended to be visible at 60 metres,

the vision is only 1/10 of the normal and the marked 6/60, and so on 6/36, 6/24, 6/18, 6/12, 6/9. As most persons with good vision see, in my experience, more than 6/6, or lettering expected to be read only at a shorter distance than 6 metres, these are put down at 6/5, 6/4, 6/3 and so on according to the size of the letters.

I have worked out the acuity of vision of the 100 cases under discussion, with the following result:

Before correction by glasses.

6/3.5	were seen	by	6	right	eyes	and	7	left eyes.
6/4	"	"	7	"	"		4	"
6/5	"	"	26	"	"		35	"
6/6	"	"	15	"	"		12	"
6/9	"	"	10	"	"		15	"
6/12	"	"	2	"	"		5	"

After correction.

Average.								Average.
6 1/2.	By	8	right	eyes,	11	left	eyes	9 1/2
5 1/2	"	13	"		8	"		10 1/2
30 1/2	"	48	"		54	"		51
13 1/2	"	18	"		14	"		16
12 1/2	"	5	"		8	"		6 1/2
3 1/2	"	4	"		1	"		2 1/2

Or, to put the results in another way:

Before correction the average vision with the right and left eyes of 29 per cent. of the cases was 6/6 or better, after correction 43 1/2 per cent. of the patients saw 6/6 or better.

In two patients the right eye could not be made to see even 6/60. These eyes were "amblyopic."

It may be broadly stated that there are comparatively very few eyes whose vision cannot be improved by glasses, though this assertion is a very different thing from advising that the majority of people should wear glasses. It is only those who wear them who are able to appreciate the comfort they bestow.

In astigmatism one meridian of the cornea is more highly curved than that at right angles to it. It is said that the two most pronounced lines of curvature lie vertical and horizontal. I have worked out this question in these 100 cases, with the relationship of the curvatures to the form of the correcting glass required, and will give the results in a few words. But first I desire to criticise the method in vogue in this country for marking the axis of the corneal curvatures. When the axis is not perfectly horizontal or perfectly vertical in either eye of the same patient, the great probability is that if it is say, down and in, in the one it will be down and and in, in the other, more broadly speaking, that the axis of the one eye will in general direction correspond to that of the other. But American testing frames do not take that into practical account. Thus, if in the right eye the axis were eighty degrees, in the left, if it had the same direction, it would be marked one hundred degrees; if it were forty-five degrees in the right it would be one hundred and thirty-five degrees in the left. It would be much better to have the frames marked in figures, beginning in the same way on each eye, and giving the same figures for correspondingly positions. Mine are so marked and my calculations have been made accordingly, which, however, will not interfere with the following:

Out of 61 cases astigmatic in both eyes and having the same sign, the axis in the two eyes correspond exactly in 19. Of these 19, 12 were precisely horizontal, and 7 precisely vertical. The average difference in the axis of the

two eyes, where they did not correspond and where the plus or minus sign was the same in the two eyes, was thirty-one and two-tenths degrees.

Out of 124 eyes, 29 axes were exactly vertical and 30 exactly horizontal, a total of 59 or less than half. There were found also 56 whose axes were in the quadrant surrounding the vertical diameter and which took the plus or convex sign, and 6 in this quadrant which took the minus or concave sign. 32 taking the plus sign and 30 taking the minus sign were in the horizontal quadrant, or of plus (+) cylinders, 56 out of a total of 88, i. e., 63 1/2 per cent. inclined to be vertical, the remaining 32, or 36 1/2 per cent. inclined to be horizontal. And of minus (concave) cylinders, 30 out of a total of 36 or 83.4 per cent. inclined to be horizontal, the remaining or 16.6 per cent. inclining to be vertical.

In only two patients was the sign of the right different from that of the left. On one of these the axes corresponded in the two eyes, and in the other there was a difference between the two eyes of fifty-five degrees.

I fear this paper has not been exactly exciting, but, to bring before you the precise facts, I felt it necessary to make use of figures.

WHEN TO OPERATE FOR RIPE SENILE CATARACT, THE OTHER EYE POSSESSING USEFUL VISION.

GEO. F. KEIPER, A. M., M. D.,

LA FAYETTE, IND.

EYE AND EAR SURGEON TO ST. ELIZABETH HOSPITAL, ST. JOSEPH ORPHAN ASYLUM, CHILDREN'S HOME, INDIANA STATE SOLDIERS' HOME, ETC., ETC.

In order to test the sentiment of the profession concerning the removal of a ripe senile cataract when the other eye possesses useful vision, the writer addressed the following questions to such members of the Section o Ophthalmology of the American Medical Association whose name appear in the subjoined table.

Question I. Do you remove a ripe senile cataract if the lens of the other eye is clear or if opaque possesses useful vision?

Question II. After such an operation do patients complain of the difference of refraction between the two eyes?

Their answers and remarks are given in the subjoined table. Where no reply was received the space after the name is left blank.

Name.	Question I.	Question II.	Remarks.
Allemann, L. W., Brooklyn, N. Y.	Yes.		Do not correct vision if other eye is normal.
Allport, F., Chicago, Ill.			
Antisdale, E. S., Benton Harbor, Mich.			
Ayers, S. C., Cincinnati, Ohio.	Yes.	No.	Do not correct refraction of operated eye in full.
Baker, A. R., Cleveland, Ohio.	Rarely.	No.	"If opacity of fellow eye is progressive I advise early removal of lens of blind eye."

Barck, C., St. Louis, Mo.	Yes.	Yes and no	"I leave it to the decision of the patient." "I have done it a number of times on demand."
Barkan, A., San Francisco, Cal.	Yes.	No.	Advisable because of gain in F. of V. Informs patient beforehand.
Beard, C. H., Chicago, Ill.	Yes.	No.	
Belt, E. O., Washington, D. C.	No.	No.	If urged by the patient the operation is made.
Boeckman, E., St. Paul, Minn.			
Brose, L. D., Evansville, Ind.	No.	No,	
Brown, H. H., Chicago, Ill.	No.	Yes.	
Bruner, W. E., Cleveland, Ohio.	Yes.	No,	"Do not attempt to correct the operated eye until vision of the other eye has become poor."
Brunson, R , Hot Springs, Ark.	No.	Yes.	Operates if patient demands operation and when it is a question of a short time when other eye is seriously involved.
Bulson, A. E., Jackson, Mich.	No.	Yes.	
Bulson, A. E., Jr., Ft. Wayne, Ind.	No.	No.	Have no trouble with refractive difference because patient is informed beforehand.
Burnett, S. M., Washington, D. C.	Yes and no	Yes if corrected.	"If there is commencing cataract in the other eye I advise the removal of the mature cataract."
Carrow, F., Ann Arbor, Mich.	Yes and no	No.	"And the other is opaque enough to interfere in the slightest way with satisfactory vision, I always advise extraction."
Chestam, Wm., Louisville, Ky.	No.	Yes.	
Chisolm, F. M., Baltimore, Md.	Yes and no	No.	"My rule is not to advise operation when the other eye has good vision. The exception is sometimes in the wish of the patient, or when the object is to increase the field of vision."
Clark, C. T., Columbus, O.	No.	No.	

Colburn, J. E., Chicago. Ill.	Yes.	No.	
Connor, L., Detroit. Mich.	No.		
Coomes, M. F., Louisville, Ky.	No.	Yes.	
Culver, C. M., Albany. N. Y.	No.		
Dayton, W. L., Lincoln, Neb.	Yes.	No.	
De Beck, D., Cincinnati. O.			
Dickenson, Frances, Chicago, Ill.	No.	Yes.	
Dudley, W. H., Easton, Pa.	Yes.	Yes if corrected.	
Eaton, F. B., San Francisco, Cal.			
Eicheltrager, W. C., Terre Haute, Ind.	No.	Yes.	
Ellis, H. Bert, Los Angeles, Cal.	Yes and no	Yes.	"I do not operate on ripe senile cataract while the other eye is useful to the extent of 6-18 vision, unless at express wish of patient."
Erwin, A. J., Mansfield, O.		Yes.	"But when one requires perfect vision it becomes necessary to operate early."
Fox, L. Welston. Philadelphia, Pa.	Yes.	No.	"I find range of vision more than compensates for disturbance produced by the anisometropia."
Friedenwald, H., Baltimore, Md.		Yes.	"Unless it is made necessary because of the need of a greater field of vision."
Frothingham, Geo., Detroit. Mich.	Yes.		"It only helps in the field of vision and in judging distance."
Gifford, Harold. Omaha, Neb.	Yes and no		I operate . . . if the patient is not going to be where he can be seen at intervals for months . . . otherwise not.
Gould, Geo. M., Philadelphia, Pa.			"I operate so little that my opinion on the subject would be valuless.

Gradle, H., Chicago, Ill.	Yes.	No.	
Hale, Albert, Chicago, Ill.	Yes.	No.	Complaint of anisometropia at first but not ultimately.
Hansell, H. F., Philadelphia, Pa.	Yes.	No.	
arlan, Geo. N., Philadelphia, Pa.	No.		
Harlan, H., Baltimore, Md.	Yes.	No.	Increased field of vision, less danger from accidents.
Hawley, C. W., Chicago, Ill.	Yes.	No.	
Heath, F. C., Indianapolis, Ind.	No.	Yes.	"Except that when I fear ripe cataract left too long may become hypermature"
Holmes, C. R., Cincinnati, O.	Yes.	No.	
Hotz, J. C., Chicago, Ill.	No.		
Howe, Lucien, Buffalo, N. Y.	No.		
Hubbell, A. A., Buffalo, N. Y.,	Yes.	No.	"Providing patient is not over 65 years of age."
Jackson, Edward, Denver, Colo.	Yes and no		If patient is old and feeble, no. If patient is young and active, yes. Chief reason is in field of vision Risk from hypermature cataract quite serious.
Jennings, J. E., St. Louis, Mo.	Yes.	No.	
Knapp, H., New York City.	Yes.	No.	"Help to enlarge field of vision."
Knapp, A. J., Evansville, Ind.	Yes.	No.	More comfort in seeiug with two eyes than with one.
Knapp, Geo , Vincennes, Ind.	No.		
Kollock, C. W., Charleston, S. C.	Yes and no	Yes.	If patient is a merchant, no. If patient is a farmer or laborer, yes.
Lantenbach, L. J., Philadelphia, Pa.	No.		Except for cosmetic reasons or at special request of patient.

Le Mond, R. F., Denver, Col.	Yes.	No.	"I do, if not entirely senile or opaque. I do not operate unless over 60 years of age.
Lippincott, J. A., Pittsburg.	Yes and no	Yes and no	Lets patient decide. Advantages of removal, (1) greater safety in walking street; (2) appearance.
McReynolds, J. O., Dallas, Texas.	Yes and no	Yes and no	"Patient is better satisfied after a successful extraction of an opaque lens even if the remaining eye is good."
Maire, L. E., Detroit, Mich.	Yes.	No.	
May, C. H., New York City.	Yes.	No.	
Means, S. C., Columbus, O.	No.	Yes.	Except at patient's wish.
Milliken, B. L., Cleveland, O.	Yes.	No.	No correction attempted of the operated eye.
Minney, J. E., Topeka, Kansas.	Yes.	No ultimately.	
Morton, T. G., Philadelphia, Pa.	No.	No.	
Norton, C. E., Lewistown, Me.			
Oliver, C. A., Philadelphia, Pa.	Yes.	No.	
Pancoast, J. W., Philadelphia, Pa.			
Parker, W. H., Detroit, Mich.	No.	No.	
Pollak, S., St. Louis, Mo.			
Prince, A. E., Springfield, Ill.	No.	Yes.	
Pyle, W. L., Philadelphia, Pa.			
Ray, J. M., Louisville, Ky.	Yes and no	Yes.	If better than 25-50, no. If less than 25-50, yes.
Reik, H. O., Baltimore, M. D.,	No.		

Reynolds, D. S., Louisville, Ky.	Yes and no		If patient is anxious or there is commencing cataract in the other eye, yes.
Ring, G. O., Philadelphia, Pa.	Yes.	No.	Field of vision thereby increases.
Risley, S. D., Philadelphia, Pa.	Yes.	No.	"Such persons are safer on the street and elsewhere."
Rogers, F. G., Providence, R. I.	No.	No.	Have done it a number of times however. Patients soon become accustomed to the anisometropia.
Rogers, W. K., Columbus, O.	No.	No.	"Unless by some contributing indication."
Roy, Dunbar, Atlanta, Ga.	No.	Yes.	
Sattler, Rob't, Cincinnati, O.	Yes.	Yes.	However is in doubt as to the best policy.
Savage, G. C., Nashville, Tenn.	No.	No.	
Schneideman, T. B., Philadelphia, Pa.	Yes.	No.	Field of vision extended.
de Schweinitz, Geo., Philadelphia, Pa.	Yes and no	Yes at times.	To avoid hypermaturity, for cosmetic purposes and to improve field of vision, yes.
Sinclair, A. G., Memphis, Tenn.	Yes.	No.	
Sinclair, J. G., Nashville, Tenn.			
Sisson, E. O., Keokuk, Iowa.			
Smith, Eugene, Detroit, Mich.	Yes and no	No.	If resident of city, yes. If resident of country, no.
Southard, W. F., San Francisco, Cal.	Yes.	No.	Vitreous is liable to degenerate.
Standish, Myles, Boston, Mass.	Yes.	No.	Generally in persons of active life.
Starkey, H. W., Chicago, Ill.	Yes and no	No.	If vision in other eye is less than 20-50, yes.
Stevens, C. W., New York City.			
Stevens, G. T., New York City.	No.	Yes.	

Stevenson, D. W., Richmond, Ind.	Yes.	No, if not corrected.	If "best eye will show a progressive failure of sight, I operate on the other eye."
Strawbridge, G., Philadelphia, pa.	No.	Yes.	
Strickler, Louis, Cincinnati, O.	Yes.	Yes and no	Enlarged field of vision gained.
Stirling, A. W., Atlanta, Ga.	Yes.	No.	
Sweet, W. M., Philadelphia, Pa	Yes and no	Yes.	(1) "Only when the patient complains of the lost field on the cataract side interfering with his work; or when he is anxious to have sight restored on this side.
Theobald, E., Baltimore, Md.,	Yes.	No.	Usually fine incipient opacity in the other eye anyhow.
Thomas, C. H., Philadelphia, Pa,			
Thompsou, D. A. & J. L., Indianapolis.	No.	Yes.	"And many times are really angry at you for operating."
Tiffany, F. B., Kansas City, Mo.			Refers to "late book Anomalies and Diseases of the Eye" for answers.
Todd, F. C., Minneapolis, Minn.	Yes.	Yes.	
Veasey, C. A., Philadelphia, Pa.	Yes and no	Yes and no	If patient's vocation is out of doors, yes. If patient's vocation is upon near work, no. Correction bothers 1st class; correction does not bother 2nd class.
Ware, L., Chicago, Ill.	No.		
Weeks, J. E., New York City.	Yes and no	No.	If other lens is becoming opaque, yes. If other lens is clear and patient desires removal of cataract, yes.
Wescott, C. D., Chicago, Ill.	Yes.	No.	Patient gets a larger field of vision and gets about more easily
Wheelock, K. K., Ft Wayne, Ind	Yes and no	No.	"If the lens in good eye gives useful vision up to the acuity 25-70, no "
Wilder, W. H., Chicago, Ill.	Yes.	No.	Increased field of vision
Williamson, C. H., Boston, Mass.	No.	Yes.	

Wood, C. A., Chicago, Ill.	Yes.	No.	"The advantages, both present and prospective, of improving the vision by operating on the cataractous eye seem to me so real that I usually advise the extraction."
Worrell, J. A., Terre Haute, Ind.	Yes aud no	No.	When cataract is entirely unilateral, no. When cataract is entirely bilateral, Yes. Increased fieid of vision gained by operation
Wright, J. W., Columbus, O.	No.	Yes.	
Würdemann, H. V., Milwaukee, Wis.	No if lens is clear; yes if there are signs of progressing lenticular opacity.	Yes and no	Increased field of vision; protection against economic blindness if other eye is losing vision.
Young, H, B., Burlington, Ia.	Yes and no	Yes and no	(1) No positive rule. Depends largely upon the patient's surroundings. (2) Complaint does not usually last long.
Ziegler, S. L., Philadelphia, Pa.	Yes.	No.	
Zimmermann, M. W., Philadelphia, Pa.	Yes and no	No.	Permits patient to elect.
Bryant, D. C., Omaha, Neb.	Yes and no		"I do not remove senile cataracts unless the second lens is already affected."
Thompson, J. H., Kansas City.	Yes.	No.	"Did not operate in early days but do now."

The writer desires to urge the removal of the ripe senile cataractous lens, irrespective of the condition of the other one, because from above if the operation is ultimately successsful the advantages gained are:

1. The patient has a larger field of vision.

This is a source of protection against accidents whose cause may originate from the otherwise blind side.

2. The avoidance of the dangers and difficulties of extracting an over ripe lens.

3. Continuous vision, because the other lens is usually affected.

4. The patient possesses more comfort with vision in both eyes.

5. The patient's appearance is better.

The objections urged against the removal of the ripe cataractous lens when the other eye possesses useful vision are mainly from the standpoint of the difficulty of correcting satisfactorily the difference of refraction (anisometropia). No attempt should be made to correct the aphakic eye until the vision of the other eye is so seriously impaired as to be almost useless.

DEATH FROM MENINGITIS FOLLOWING ENUCLEATION OF THE EYEBALL.

By M. V. Ball, M. D.,

WARREN, PA.

To the list of deaths following enucleation of the eye I desire to add one from my own practice. This unfortunate event whenever it occurs seems but to strengthen the feeling, that every operation, no matter how simple, has its dangers.

Deaths following enucleation have occurred too often and in the hand of the very best operators and apparently under the same conditions, to be nothing more than accidents.

Noyes places the risk at about 1 in 4000 and quotes several authors as reporting 40 deaths, nearly all by meningitis.

Knapp, in Norris and Oliver's system, thinks the mortality might be 1 in a 1000. Other authors mention the fact that death has occasionally occurred. Some caution against the operation in panophthalmitis, others do not hesitate to perform it in that condition.

A. S., aged 56, born in Sweden, farmer by occupation, presented himself at my office in December, of 1900, with a slight ulceration on the cornea, due to a twig scraping the eye. At once the ulcer was touched with carbolic acid and cleaned, and I desired the man to go to the hospital. He refused and promised to carry out the treatment I prescribed, at his home, which was in an adjoining village. A solution of bichlorid of mercury 1 to 10,000 was given him to use as a wash every hour, and he was ordered to report in two days. He did not return, however, until four days had elapsed, and the ulcer then had spread. I curetted the base, touched the ulcer with the galvano cautery and again ordered hospital care but it was again refused. The patient, however, decided to remain in town and visited me every day. Paracentesis was performed the next day and careful antiseptic treatment carried out.

After several days treatment the ulcer ceased spreading, the inflammatory symptoms subsided, but adhesions had formed between the inner surface of the cornea and the capsule of the lens, and there was a large leucoma at the site of the ulcer. The eye remained quiet then for six months, when he again presented himself with a large anterior staphyloma, which was a source of irritation to the lids and caused continual lachrymation. I removed with the narrow knife the greater part of the protruding mass, giving him considerable relief. Nothing more was heard from the patient until March, of this year. A fellow practitioner in a neighboring town asked me to see the man. His eye had been quite well until a few days before, when, as he said, "a cold set in," and the eyeball became very much swollen and very painful. I visited the man at his house and found a highly suppurating panophthalmitis with edema of the neighboring parts and a great deal of tension so that the eyeball protruded very much.

The patient was chloroformed, though at first intending to enucleate the eye, I found it impossible and contented myself with an eviceration, making a broad incision through the front of the eye, letting out a mass of cheesy material and curetting and washing out all that the globe of the eye contained. Bichlorid syringing was then ordered and in two days the swelling disappeared and likewise the pain, but the eye continued to discharge. In two weeks he came to my office feeling quite well, but bothered by the discharge. I sent him to the hospital in order to remove the shell of the eye and make the orbit suitable for an artificial eye. The nurse was given instructions to thoroughly disinfect and clean the globe with 1-1000 bichlorid solution and when I saw the patient, twenty-four hours after, the eye looked clean and suitable for the operation. Holocain was injected into the tissues and as there was no pain in the orbit and patient had taken chloroform badly before, I decided to make the dissection under local anesthesia. Adrenalin was used to check the hemorrhage. The remains of the globe were difficult to dissect out because of the previous suppuration and disarrangement of the parts at the eviceration. Patient suffered considerable pain toward the last so that a few whiffs of chloroform had to be administered. Finally the

operation was completed and patient was placed in bed. The wound was not packed in order that drainage might be free, and ice was applied over the bandage. Next morning the patient was comfortable; no pain; temperature $99^{3}/_{5}$; pulse 68. The wound was dressed and it looked clean; no swelling of the neighboring parts. In the afternoon of the same day a patient was etherized in the same ward in which A. S. was lying and this greatly excited my patient, even to the extent of slight delirium. The excitement passed away, but in the evening he attempted to get out of bed in order to evacuate his bowels and he fell on the floor causing a slight scalp wound. Vomiting had occurred a 8:30 p. m., attributed to the magnes. sulf. that had been given in the afternoon. I was called at midnight and found the patient very much excited; temperature 103; respiration 40; pulse 78; and propulsive vomiting. The bowels were emptied by an enema, bromid of potassium 30 grains and a morphin hypodermic $^{1}/_{4}$ grain were given. Patient then slept for several hours but in the morning all food and medicine was refused. Temperature was $101^{3}/_{5}$; speech was confused. The wound appeared natural; no suppuration; a deep incision, with narrow knife, was made into the cavity revealing nothing. Hot bichlorid irrigation, 1-5000, was ordered and quinin grs. v.; Vomiting had stopped and in a few hours the mind cleared and nourishment was taken every hour. Questions were answered intelligently and no pain was complained of, at 2 p. m. temperature was $101^{3}/_{5}$ resp. 24, pulse 78, at 4 p. m. patient became restless again complained of severe pain in the head, tossed from side to side and moaned and there was slight retraction of head. Temperature was then 102, pulse $98^{1}/_{5}$.

Bromid and chloral was administered and, restlessness continuing, at 5 p. m. a morphin hypodermic was given. Delirium increased. At 9 p. m. temperature was $102^{1}/_{5}$; pulse, 104. Refused all food and medicine. At 12, midnight, another hypodermic of morphin, which produced some sleep but at 4 a. m. very restless; muttered and moaned continually; perspired very freely, refusing all food, and had an involuntary movement of the bowels. Temperature in axilla was $101^{3}/_{5}$; pulse, 102; recognizes no one. The wound, dressed again and probed, showed

no sign of suppuration. At 7:45 a. m. temperature was $103^{3}/_{5}$; pulse, 118. Urine was drawn with catheter and showed presence of considerable amount of albumen. Unconsciousness now increased, developing into coma. Temperature gradually increased, as well as pulse, and just before death, which occurred at 1:15 p. m., the temperature was $105^{3}/_{5}$ and pulse 162.

After death, the cavity of the orbit was explored superficially, without findlng any evidence of suppuration. No autopsy was permitted.

From all the symptoms, death was undoubtedly due to meningitis. The patient, although robust in appearance, seemed to be deficient in resistance. The corneal ulcer assuming the serpiginous variety and leading to corneal abscess; then the severe form of suppuration arising in an eye that had been quiet for six months, and without any assignable cause, and finally death, following the removal of the stump. All this seemed to show a lack of vitality.

In an accident of this sort, one is apt to search for reasons and to look for faults. It is possible that there was some defect in the antiseptic treatment. The instruments were boiled; the holocain was boiled a few minutes before use. The adrenalin was clean and preserved in a glass-stoppered bottle with chloretone; but it was not boiled, as I believed this could not be done without impairing its properties. I have since learned that boiling does not injure its effect.

There was considerable pain in spite of the local anesthetic: and as I could not work fast because the anatomical topography was so altered, there was undoubtedly some strain on the nervous system. The checking of hemorrhage by the adenalin and ice may also have been a fault, although there was no evidence of a local thrombos anywhere.

Meningitis occurs, according to Noyes, in suppurating eyes when not enucleated. It occurs when they are enucleated, when no suppuration has been present. But it happens more frequently after enucleation, during suppuration. In this particular case, suppuration had been present, but acute suppuration had subsided and a slight discharge remained. It is to be regretted that an autopsy was not obtainable.

PAPILLOMATOUS DEGENERATION OF THE CONJUNCTIVA.*

By H. V. Würdemann, M. D.,

MILWAUKEE, WIS.

ILLUSTRATED.

Although the conjunctiva is one of the most easily offended structures of the body; being perhaps the most sensitive of the mucous membranes and easily excited to inflammation, its diseases, that are followed by degenera-

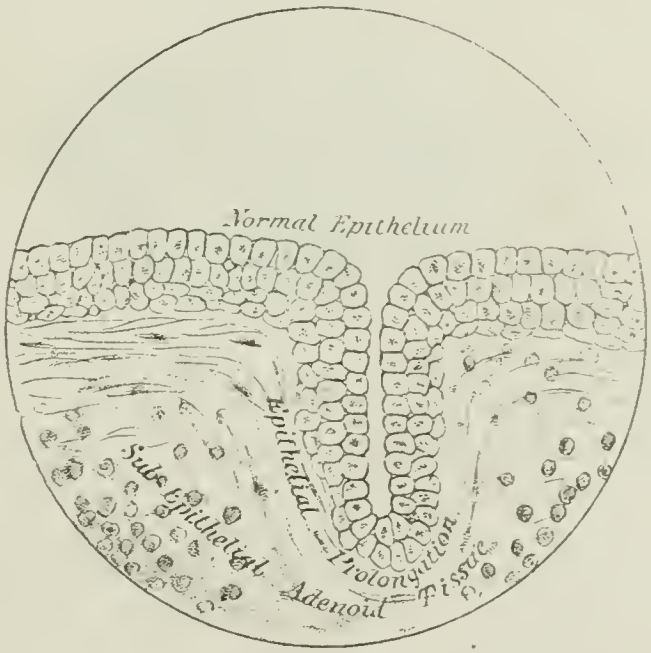


Fig. 1. Microscopic Section of Normal Human Conjunctiva Showing Crypt Lined with Epithelium.

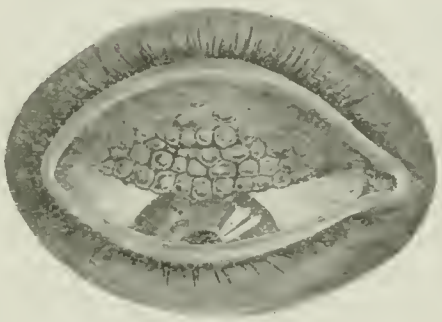
tive changes, are almost entirely of the inflammatory type; new growths, however, are especially rare. Despite the fact that the lining of the eyelids and the covering of the eyeball has, from time immemorial, been subjected not only to natural traumatism, but to surgical operations of the most varied character and some of them of barbarous types, wounds easily heal and even though the under surface of the lids be almost completely denuded of epi-

*Read before the Milwaukee Medical Society, March 4, 1902.

thelium, yet by reason of the epithelium lining the conjunctival crypts regeneration of the surface epithelium generally occurs and the lid may again be as good as new. Apropos of the effects of drastic treatment causing the formation of new growths and of speedy resolution when the foreign growth is removed, I cite the following case:

F. R., age 10, came January 13, 1902, her mother stating that for five years or longer, the child's eyes had been sore; that she had received a great deal of treatment from various physicians and that all of them while beginning with apparently mild remedies, finally resorted to burning the lids with blue-stone or strong solution of nitrate of silver. The appearance of the case, similar in both eyes, bore out her statements, for the ocular conjunctiva was stained from the effect of nitrate of silver. There was no affection of the bulb or of the tarsal conjunctiva of the lower lid, but on everting the upper lid strongly, it was seen to be studded over with firm hard granulations of the size of No. 4 shot. These were ranged in four or five rows extending over a triangular surface beginning at the fold of transmission but not involving it, extending upward and outward so that they covered about $^1/_2$ the surface of the everted eyelid (see Fig. 2): these were lighter in color than the surrounding conjunctiva which was but lightly infiltrated or inflamed and with the lid in the natural position rubbed against the upper ocular conjunctiva, the patient being unable to look upward without much irritation and hence walked with the chin protruded and the eyes cast downward. The irritation of the roughened lid had produced a reddened area involving about the upper fifth of the eyeball. The complaints were of photophobia, lacrimation and asthenopia. The inflammatory symtoms were worse in dusty and windy weather and in the summer; the child being usually better in the winter. Thus the history was much like that of vernal conjunctivitis but the disease was confined to a limited area; there had never been any circumcorneal hypertrophy and the granulations were extremely hard to the touch. My preliminary diagnosis was that of granular conjunctivitis in the trachomatous stage, a disease which is relatively common in this locality, particularly among the lower classes.

On account of the large amount of inefficacious treatment to which the child had already been subjected and on account of the good results we usually secure from grattage and brossage in trachoma and because the upper lid was so apparently tight upon the eyeball, I advised operative procedure for removal of the granulations and canthoplasty to widen the palpebral aperture. Accordingly on Jan. 21st, at the Trinity Hospital, under chloroform narcosis, I first made the canthotomy and then proceeded to squeeze out the granulations by the roller forceps but found that the instrument made no impression upon them. I accordingly endeavored to scarify and brush them out using the Chalmers Jameson expression instrument. Neither of these had any effect and I finally resorted to exci-



Fi. 2. Papillomatous Degeneration of the Conjunctiva.

sing the whole of the roughened surface of the upper lid In doing this, I shaved off the granulations leaving some of the conjunctival tissue after which the solid stick of nitrate of silver was applied and neutralized at once with salt solution. The patient was then put to bed, iced compresses resorted to for an hour at a time with two hour intervals; the secretions were washed away with salt solution and a ½ per cent. solution of holocain occasionally instilled. Three days later it was found necessary to chloroform the child again in order to remove the stitches of the canthoplasty and at this time the under surface of the lids was again cauterized in the area occupied by the granulations with the solid stick of nitrate of silver; iced compresses were again used for 24 hours and then changed to hot compresses, the lids being kept greased with 5 per cent iodoform ointment. In one week the case left the hospital and was treated daily for another week with one

to two per cent. nitrate of silver solution, the weak antiseptic wash being used at home. Since that time, for several weeks, cuprol has been dusted upon the everted lids.

February 25th, 1902: The under surface of the lids has now an almost normal appearance, the epithelium having regenerated to a marvelous extent; there is no entropion or distortion; the symptoms of photophobia, lacrimation and inflammation have entirely disappeared, and as the case is practically cured, I, therefore, report the same to the

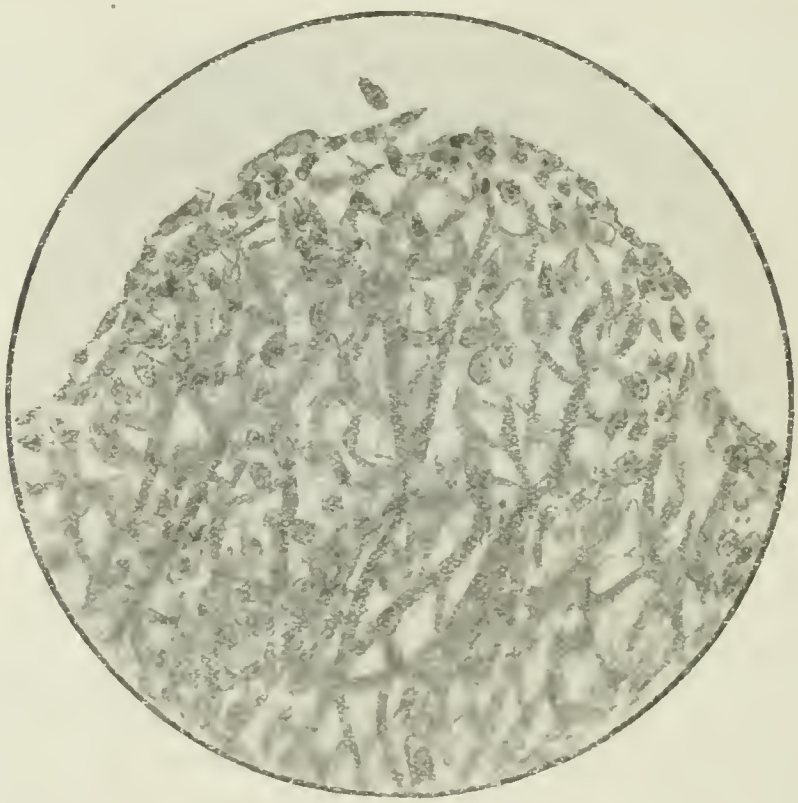


Fig. 3. Microscopic Section of Papilloma.

society. Several of the granulations were removed in toto for microscopic examination; they are about the size of a No. 4 shot, are very hard and cannot be crushed by finger-pressure; they were hardened in alcohol, sectioned and stained with hematoxylon and eosin, and under the microscope, are seen to be composed of a connective tissue stria in which large numbers of epithelial cells are to be found. The surface of each little tumor is entirely covered with intact epithelial cells arranged on an average in three layers, from the under surface of which epithelial prolongations dropped downward into the connective

tissue stria. The microscopic examination thus shows the tumor to be a papilloma of the myxo-fibromatous type; in other words, a wart.

The refraction under cycoplegia is R+3.00⊂+.25,90°
L+3.00⊂+.75,90°

With these lenses, V=6/VI.

As to the causation of this new growth, I am inclined to think that the disease was originally a granular conjunctivitis which was too freely treated by cauterizing the granulations, rather than using the caustics for antiseptic and stimulating purposes, to which we have practically relegated them in the treatment of granular conjunctivitis. The little patient, as is common at this age, has a number of warts about the hands and, perhaps, may have been predisposed to this form of new growth. Although but a short time has elapsed since the operation, I am of the opinion that the growths will not return and that we have secured a cure through the surgical treatment. The speedy regeneration of the epithelium of the lid in the sites of the papillomata is remarkable, as is, likewise, the speedy relief of the symptoms.

May 15th, 1902: There had been some return of the papilloma, which, on this date, was treated on one side by the electro-cautery, applied carefully to each protrusion.

May 19th: The other side was treated in the same manner.

Sept. 15th, 1902: The child has been in the country all summer, during which time the eyes have been quiet, and on this date the lids are free from roughness, but have much cicatricial tissue; *i. e.*, are in much the same condition as the 3rd stage of trachoma.

ABSTRACTS FROM ENGLISH-COLONIAL OPHTHALMIC LITERATURE.

By Frank Allport, M. D.,

CHICAGO, ILL.

(Quarter ending September 30, 1902.)

Glioma of the Retina; a Remarkable Family History.

Newton, R. Earle, M. B., C. M. *(Australian Medical Gazette.)* The author reports the case of a child of two years who had been completely blind for twelve months. A glioma mass could be seen through each pupil, involving the lens and growing into the anterior chamber—the irides being pushed markedly forward. The growths were nodular and yellowish gray, the intra-ocular tension was increased and there was apparently great pain; there was no evidence of secondary implication of the brain or other organ.

The patient was the youngest of a family of sixteen. Four of the children were alive and well; two had died within a month of birth, of bronchitis. Ten had all been affected by glioma of the retina, and all, except the patient, were dead. None lived beyond three years, except one who was operated on for unilateral growth and who lived to five, then died of recurrence.

Of the ten cases, three were unilateral and seven bilateral (70 per cent. bilateral). Of the seven who died without operation, the eyeballs ruptured in every case except one, and this child was said by the medical attendant to have died of cerebral implication. Five cases were male and five female. One of the father's brothers died in infancy of some eye complaint.

Hole in the Macula Lutea.

Byers, W. G. M., B. A., M. D. *(Montreal Med. Journal*, July, 1902.) The patient was a boy of sixteen who, three years ago, was struck on the eyebrow by a pebble thrown with not much force. For a day or two there were some optical illusions, and at time of examination there

were evidences of a positive scotoma. At the time of injury there were no subjective symptoms, such as flashes of light, nor was the eye red nor sensitive to light.

With the ophthalmoscope there could easily be seen in the macular area a rounded, depressed, sharply-defined hole, with deep red base, about one-half the size of the optic disc. Here and there were spots of organized exudate and some crystals of cholesterin.

Vision in right eye was $^{6}/_{60}$ (not improved); the central vision for colors was not impaired.

Dilatation of Pupil in Chlorodyne Poisoning.

POWELL, ARTHUR, B. A., M. Ch. (*Ind. Med. Gazette*, Aug., 1902.) In the last four cases of fatal chlorodyn poisoning that have come under the notice of the writer, there has been wide dilatation of the pupils. However, there was noted quite a variety in the composition of chlorodyn. One sample contained, to the ounce, four grains of morphin and the equivalent of 25 minims of dilute hydrocyanic acid. Another sample, 55 minims of dilute hydrocyanic acid. Therefore, if a patient should swallow two ounces of chlorodyn, the dilatation caused by the hydrocyanic acid might easily overshadow the contraction caused by the morphin.

A Case of Recent Acute Suppuration of the Cornea Successfully Treated After Ligation of Canaliculi.

BULLER, FRANK, M. D. (*Montreal Med. Journal*, March, 1902.) After losing an eye, operated upon for cataract in the presence of a punctum which appeared not pathological, but simply, unhealthy, it occurred to the author to tie off this frequent source of infection; and on another patient, with this means of precaution, a successful cataract operation was performed.

In a case of extensive suppurative keratitis, in connection with disease of the tear sac, the tear sac was washed out with with a one-three thousandth bichloride solution and the canaliculi then ligated. The conjunctiva was thoroughly cleansed, the diseased cornea touched with formalin one-sixtieth, the conjunctival sac filled with a 10 per cent. airol ointment, and a compress bandage applied. For two days there was some reaction from the formalin, but after that there was steady improvement. No difficulty was experienced in reopening the canaliculi

and there was no trouble from increased accumulation in the tear sac.

A Case of Sarcoma of Eyelid.

APTE, Y. G., B. A., L. M. S. *(Indian Med. Rec.)* The patient was a Hindu carpenter. About three years previous he had noticed a small swelling on the forehead, which had gradually increased. Finally it invaded the bridge of the nose and came down to lower eyelid; it was then operated upon, but was not entirely removed, the portion at the inner canthus being allowed to remain, for fear of injuring the eye. Some time afterward this portion began to grow, until it became a large mass overhanging the eye and cheek, and pressing upon the nose so that mouth breathing was necessary. There were no adhesions on the cheek or on nose, and when the tumor was lifted the eye itself was found not to be invaded.

In removing the tumor, rapid incisions were made through the attachments and bleeding controlled by firm sponge pressure. The upper eyelid was involved and removed, as well as the inner part of the lower lid, and part of the conjunctiva at the inner canthus. The eye suffered from exposure from the loss of the eyelid, but the wound healed without trouble.

On cutting into the tumor, it was soft, fleshy and vascular; a fresh section, under the microscope, showed a number of round cells with little connective tissue.

Soft Cataract, Following Convulsions, in a Child Under Two Years of Age.

THOMAS, EDWARD H., M. B., L. R. C. P. *(Indian Medical Record.)* A baby (five months of age) was affected by convulsions and, at first, had them every few days and a great many, twenty-four in one night. Later on, the attacks recurred at intervals of every two months. The chief cause of irritation was in the bowels, the child seldom having passed a good free stool. The convulsions continued to recur for about two years, when the child completely recovered from them. At the beginning of the last six months of this time the parents noticed a change in the patient's eyes, and at the end of the six months the child was totally blind, having developed soft cataracts in both eyes.

Optic Neuritis.

BARRETT, JAMES W., M. D., F. R. C. S., and ORR, W. F., M. B., B. S. (*Intercolonial Medical Journal of Australasia*, July 20, 1902.) The authors believe that if cases of double optic neuritis were carefully followed to their termination it would often be found that either the cerebral lesion present had disappeared and there was complete recovery of health and complete or partial recovery of vision, or that there had been no cerebral lesion, but an optic neuritis pure and simple.

They cite eight cases, five of which have recovered health. As to vision—in two cases, the result is good; in one, fair, and in two, disastrous.

Diplopia, Following Herpes Zoster Ophthalmicus.

BARRETT, JAMES W., M. D., F. R. C. S., and ORR, W. F., M. B., B. S. (*Intercolonial Med. Jour. of Australasia*, July 20, 1902.) The authors cite two cases. One, after three days of pain in the right eye, developed intense herpes, affecting the cornea of the right eye and the course of the right supra-orbital nerve. Later edema spread over the whole of the right side of the face and to the left eyelids; the left eye, however, was not affected. At the end of a month the patient had practically recovered from the pain and the corneal affection, but during convalescence he had noticed some diplopia. Some four months after recovery his vision, with refraction corrected, was found to be normal. The diplopia was still present, but gave the patient no troubble. There is no paresis of accommodation of either eye, and the convergence is apparently normal. The diameter of the right pupil is somewhat greater than that of the left, and the right eye reacts more slowly.

The second case was just recovering from a severe herpetic eruption along the course of the left supra-orbital nerve and there was present an iritis in the left eye. His vision, with refraction corrected, was: right eye, $^{6}/_{5}$, and left eye, $^{6}/_{18}$. There was in the left eye extensive posterior synechiæ. As in the other case, the patient did not complain of any diplopia, but, upon examination, he recognized it.

Concussion Cataract.

BARRETT, JAMES W., M. D., F. R. C. S. (*Intercolonial*

Med. Jour. of Australasia, July 20, 1902.) The patient was struck on the face and arms by portions of a falling ceiling. The right pupil was dilated and without reaction to light or accommodation. There was a fine, irregular opacity in the anterior capsule about 4 to 5 mm. in diameter. There seem to be fine spots of opacity over the entire anterior surface of the lens. Under homatropin, the vision of the right eye can be brought to $^{6}/_{6}$ by $\frac{+ .5}{+ .5,\ 120^{\circ}}$

The author thinks that the concussion has caused some malnutrition in the lens, in and under its anterior capsule.

ABSTRACTS OF GERMAN OPHTHALMIC LITERATURE.

BY

ROBERT L. RANDOLPH, M. D.,

BALTIMORE, MD.

AND

CHARLES ZIMMERMANN, M. D.,

MILWAUKEE, WIS.

(Quarter ending September 30, 1902.)

On the Symptomatology of Headaches.

HIRSCH, DR. G., Halberstadt. (*Butache Med. Wochenschrift.* 1902, No. 27.) A man, aged 18, was suddenly seized by an epileptic attack after constantly wearing — 5.00 for two and one-half years. From that time on, the patient suffered from headache, and the attack recurred every six or eight weeks. An examination by H. revealed hypermetropic astigmatism. With + 3.50 full vision was obtained, and the headaches subsided, but not the epileptic seizures. H. considers the immense accommodative strain under the wrong glasses as the exciting element of the epilepsy. Some other cases of wonderfully wrong "corrections" of errors of refraction by opticians are enumerated.

Prevention of Blenorrhea Neonatorum by Crede's Method.

LEOPOLD, Dr. G., Professor, Director of the Obstetrical Clinic at Dresden. (*Berl. Kl. W.*, 1902, No. 33.) Although blenorrhea neonatorum has almost disappeared from the lying-in hospitals, and Credé's method is as certain as harmless, the percentage of blindness from blenorrhea has not decreased in the same ratio. Statistics, gathered by Cohn, show that 31 per cent. of children under ten years, of German institutes, have become blind from

blenorrhea. Therefore L. advocates compulsory introduction of Credé's method. In his experience, on 30,000 children he never saw any unfavorable reaction, and asserts that if the latter were observed, Credé's exact prescriptions had been deviated from. But they are of paramount importance. According to Runge's and Gusserow's excellent results obtained with 1 per cent. solutions of nitrate of silver, L. adopted the latter in 698 successive cases without noticing any irritation. Only one secondary infection occurred.

On Strabismus Operations in Congenital Paralysis of the External Rectus.

SCHOELER, DR. F., Berlin. (*Ibid.* p. 783.) From 1878 up to 1902, 2330 tenotomies were performed in Prof. Schoeler's clinic, of which only five showed an unusual course. These are briefly reported. In case 1 the child made an untoward movement with the head, so that the tendon of the internal rectus tore with prolapse of vitreous; conjunctival suture; recovery. In case 2, in a man, aged 20, numerous cicatricial bands had to be severed before the tenotomy. The sclera was injured, but without prolapse of vitreous; healing undisturbed. The three other cases of cutting the sclerotic occurred in congenital paralysis of the external rectus, of which altogether eight cases were observed, apparently due to anatomical deviations. Either the tendon was not attached to a ridge on the sclerotic and formed a part of the latter, or the vitreous bulged into the tendinous attachment, or these abnormal relations between tendon and capsule of the globe were due to changed tension of the muscles and their pressure on the eyeball.

On Hereditary Syphilitic Changes of the Fundus, with General Remarks on Ocular Affections in Congenital Lues.

SIDLER-HUGUENIN, M. D., Zürich. (*Beitr. z. Aug.*, Heft 51.) In this elaborate paper of 256 pages, which ought to be studied in its original, S. investigated, from 120,000 clinical histories of the eye clinic at Zürich, the private practice of Prof. Haab and his own, the various types of hereditary syphilitic affections of the fundus, their diagnostic significance, their prognosis and therapy, the condition of the visual field and of light sense, and their propagation to the second generation. The author

made it a special point to examine the cases again after years, and also their parents and other children of the same family. Thus 125 cases are enumerated in tabular form, but only such in which the diagnosis of congenital lues was confirmed, by the alterations in the fundus, and other symptoms. Thirty pages are devoted to clinical and anatomo-pathological observations from literature. The 125 ophthalmoscopic conditions show a great polymorphism. However, certain changes of the optic nerve, retina, chorioid and bloodvessels recur quite frequently and constitute some uniform types, of which S. could distinguish four. Type 1 consists in yellowish-red small spots and pigment dots, illustrated by a lithographic drawing and by Fig. 39 of Haab's Atlas, 3rd edition. It was observed in 30 cases; in the slighter ones the visual field was not contracted and there was no hemeralopia. Since it has no tendency to progress, the prognosis is not bad and is better than in other forms. The symptoms of types 2 and 3 consist chiefly of chorioretinitic alterations. Type 2 is characterized by the predominance of roundish black foci (Haab, Fig. 40) and occurred in 47 cases. In 34 of these the affection was limited to the periphery; in 13, the posterior pole was also involved. Probably the chorioretinitis is initiated by diseased bloodvessels, and the accumulations of pigment start from the pigment epithelium of the retina, not from the chorioidal stroma. Undoubtedly a certain connection with interstitial keratitis and iritis exists, since this type is generally met with before or after the occurrence of parenchymatous keratitis. Light sense and visual field were normal in the majority of the cases, and the prognosis is as good as in type 1, since the affection in most cases remains stationary. Reversely, in type 3 the inflammatory symptoms preponderate in form of whitish round foci at the periphery, with a tendency to confluence into large light patches, with opacities of the vitreous (Haab, Fig. 41). Later on, a secondary pigmentation at the margin of the patches may follow, giving rise to target-like figures, as they also occur in type 2. V., visual field and light sense are not much diminished as long as the affection remains at the periphery, and the prognosis is good.

Type 4 (21 cases) is the most complicated and consists

of an affection of the pigment epithelium, coarse chorioditic or chorioretinitic foci, diseased optic nerve and retinal vessels, with corresponding diminution of V, visual field and light sense. The peripapillar zone, or the entire posterior pole in marked cases, appears uniformly grayish black, or gray as lead, and has some resemblance to the fundus of a negro. It is caused by three different processes—in the light places by atrophy of the pigment; in the grey portions, by proliferation of the pigment epithelium and by pigmentation in foci. It is remarkable, that a primary affection of the optic nerve (neuritis) occurs much less frequently in hereditary than acquired syphilis. The atrophy of the optic nerve in type 4 is secondary, and probably due to the pigment degeneration, which is analogous to that in retinitis pigmentosa.

Besides these 4 types, mixed forms were observed in 4 cases, and 5 atypical cases, which show that, in hereditary lues, the optic nerve and the retinal vessels may become affected independently of the remaining fundus. S. states that, so far, our knowledge is not sufficient to determine how often the changes of the fundus precede parenchymatous keratitis and how often they follow it. Until further proofs to the contrary, S. adheres to his observation that syphilis does not produce affections of the ocular fundus in the second generation. Accumulation of pigment around the optic disc is no pathognomic symptom of congenital lues or of hemorrhages. A tabulated synopsis of other affections in direct or indirect connection with hereditary lues, observed in the 125 cases, is added and, finally, the therapeutic results are discussed. The almost exclusive treatment, with mercury and iodin, was gradually discarded since a roborating, combined with a mild antisyphilitic, regime had the same effect. Fortunately blindness in hereditary syphilis from affections of the fundus is one of the greatest exceptions.

On the Principles of My Ophthalmo-Therapeutics.

GELPE, DR. TH., Carlsruhe. (*Beitr. z.* Aug., 1902, Heft. 52.) Forty-two thousand four hundred and forty-two patients were treated within 15 years. To cover the defects in the operation of symblepharon, G. prefers smoothly dissected pieces of epidermis of the upper arm, which shrink less than mucous membranes and assume an appearance simi-

lar to the latter. They are held in place by protective silk. G. warns against sutures, on account of their irritation. Six cases of tuberculous conjunctivitis were observed. Destruction of the new formations by galvano-cautery or sharp spoon was successful in 2 cases, in 2 tuberculine effected a cure without relapse for at least three years. Three hundred and twenty-three cases of blenorrhea, with 5.5 per cent. total losses. G. advocates treatment as early as possible, besides the general prophylaxis. As long as cases of blenorrhea occur without the presence of gonococci, G. considers the etiological importance of the latter still as unsettled. G. discriminates between juvenile (chiefly due to hereditary syphilis, 92 per cent. showed marked syphilitic stigmata) and senile parenchymatous keratitis, owing to arteriosclerosis, which, in some cases, may be syphilitic. The juvenile form yields to local treatment and inunctions of mercurial ointment, which leave the senile uninfluenced, G. obtained, in the latter, good results from rational massage, dionin (in substance, drops or subconjunctival injections) and simultaneous administration of iodide of sodium and potassium or iodeigon, which acted favorably on the general condition, especially the action of the heart. Dionin also proved very effectual in iritis and cyclitis, particularly by alleviating the pain. In many cases serous iritis disappeared entirely in country air, nothing but two daily instillations of atropine being used. Affections of the chorioid and retina were greatly benefited by mercurials and subconjunctival salt injections. Three hundred and nineteen cataract extractions were performed. G. abandoned simple extraction, after practicing it on 21 cases. Applying the blades of the iris scissors vertically to the corneal section gives the best coloboma, and the pince ciseaux is preferable. The capsule is opened exclusively with the capsule forceps, which, at the same time, allows extraction of the largest portion of the membrane. A full visual result was obtained in 87 per cent. Discission of secondary cataract is postponed as long as possible. More resistent masses are extracted by capsule forceps through a section at the upper portion of the cornea with a lance-shaped knife. Purulent infiltration of the wound is cauterized; if the infection goes further, the wound is opened and the anterior chamber washed out

with hydrarg. cyanat. 1:5000, which is repeated two or three times every other day. In glaucoma simplex relatively good results were obtained in the first five years with iridectomy: 7 per cent., no result, 93 per cent; sclerotomy: 50 per cent., no result, 50 per cent.; with medicines: 80 per cent., no result, 20 per cent. In the last ten years, iridectomy: good results, 60 per cent., no result, 40 per cent.; sclerotomy: 73 per cent., no result, 27 per cent.; medicines: 90.5 per cent., no result, 9.5 per cent. G. advocates medicinal treatment as long as possible, i e., regular use of miotics (pilocarpine 3 per cent.; if not effectual, eserin 1 per cent.), relief of accommodation and general treatment, iodid of potassium. Convergent squint is treated prophylactically up to the sixth year; from the sixth to the twelfth, optically, and then by operation, with careful after-treatment (atropin, correcting glasses, orthopedic stereoscopic exercises). In four cases of extraction of iron from the interior, atrophy of the optic nerve supervened after one and a half to two years, apparently due to the contusion caused by the violent entrance of the foreign body. G. saw many good results from the treatment of lacrimal affections with probes and, therefore, warns against the too rash extirpation of the sac; 5 to 20 per cent. solutions of protargol proved very effectual.

On the Prognosis of Intracranial Ocular Palsies.

GELPE, DR. TH., Carlsruhe. (*Ibidem.*) A synopsis of 147 cases of intracranial ocular palsies, observed for years, is given in tabular form. All peripheral and orbital paralyses are excluded and those following diphtheria, or intoxications by lead, nicotine and other substances, which G. considers as peripheral. The author calls attention to the well-known fact that, according to more recent investigations, Mauthner's theory of the nuclear seat of partial ophthalmoplegia has been invalidated, since affections of single groups of fibres of a nerve may be basal. The prognosis of the intracranial o. p. is considered from three points of view: 1. Is the occurrence of an i. o. p. in a so-far apparently healthy individual a symptom of general affection of the brain or spinal cord? 2. Do all i. o. p's. furnish a clue as to the prognosis of a manifest cerebral affection, or only certain forms? 3. Do the various forms of i. o. p. allow one to reach conclusions

with regard to the etiology of the third category (Mauthner) and thus to the efficiency of any kind of treatment? Previous cerebral affections were found in 30 per cent., none in 70 per cent.; 57 per cent. of the latter remained healthy after the occurrence of the i. o. p., a third acquired a specific nervous trouble which, after more or less time, ended fatally. In the majority (35 per cent.) cerebral apoplexy ensued (especially in paralysis of the III and IV nerves); in 26 per cent., locomotor ataxia; 12 per cent. had polyencephalitis (disseminated sclerosis, paralysis) or died of cerebral tumor. Of the previously affected, an arrest or slow progression took place in 33 per cent., while in 21 per cent. the catastrophe was accelerated. In 46 of all 85 cases the general nervous affection was deterred. This shows that the prognosis of the i. o. p., quoad vitam, is not absolutely bad.

As to point 2 it must be remembered that the nature and situation of a cerebral trouble cannot be diagnosed with any amount of certainty from the i. o. p., unless associated with other paralyses. Consequently nothing definite can be said as to the prognosis. Of G's. cases 69.3 per cent. were nuclear palsies (III nerve 41.2 per cent., VI 26.1 per cent.). 89.4 per cent. of interior, 80 per cent. of mixed and 71.5 per cent. of exterior ophthalmoplegia were nuclear. Comparing basal, nuclear, fascicular and cortical paralyses, the prognosis is worse the more central the affection is located.

In answer to the third question whether the special kind of ocular paralysis admits of a conclusion as to the etiology of the third category, among the basal paralyses lues was found in 11.6 per cent., arteriosclerosis in 20.9 per cent., among the nuclear lues 77.3 per cent., arteriosclerosis 41.5 per cent., among the fascicular lues 3 per cent., arteriosclerosis 33.4 per cent., among the cortical lues 3 per cent., arteriosclerosis 4.2 per cent.

G. sums up the following important facts: 1. Half of all ocular paralyses are syphilitic. 2. Among these the III nerve is affected oftenest (38.1 per cent.), the VI 17.5 per cent., IV 14.3 per cent. 3. The greatest percentage of lues is found in nuclear (77.3 per cent.), the least in cortical and fascicular paralyses (3 per cent.), in basal 16.7 per cent. 4. The more complicated the paralyses, i. e.,

the more the ocular nerves of both sides (ophthalmoplegia mixta) are damaged, the greater is the probability of a syphilitic process. 5. Arteriosclerosis, which plays an important part in the nuclear affections (41.5 per cent.), must be chiefly considered as the cause of simple paralysis of the VI nerve (47.8 per cent.).

On Perforating Wounds of the Sclerotic, their Treatment and Prognosis.

GELPKE, DR. TH. *(ibedem.)* Among 52 cases the left eye was injured 32 times (61.5 per cent.), the right 20 times (38.5 per cent.), which corresponds with the experiences of other authors. In 24 cases the globe was preserved, without damage to the other eye, with good visual result in 16 (66.7 per cent.), relatively good in 2 (8.3 per cent.), unfavorable in 6 (25 per cent.). In 10 cases the conservative treatment, at first attempted, had to be replaced by enucleation to avoid sympathetic ophthalmia, and the rest demanded immediate removal of the globe. Great stress is laid on antisepsis and careful suturing of the wound. If the injury occurred several hours previously a subconjunctival injection of cyanide of mercury is added and repeated if necessary. Foreign bodies are extracted as soon as possible and any delay is severely denounced. The sideroscope is highly appreciated, while the Roentgen rays are of great value in locating foreign bodies in the orbit. Sympathetic ophthalmia occurred in 6 cases, sympathetic irritation in 5. The treatment consisted in energetic mercurial inunctions, 5.00 to 10.00 per day. Applications of extrait ciliaire, devised by Dor, continued for weeks, had absolutely no effect. Of all prophylactic operations G. prefers enucleation. The 52 cases are appended in tabular form.

Injuries of the Eye by Foreign Bodies.

VOSSIUS, PROF. DR. A., Giessen. *(Transactions of the Upper Hessian Society of Natural Science and Medicine,* Vol. 31.) Out of 39 cases of injuries of the eyes by pieces of iron, 19 were encapsulated, in 6 they were extracted by magnet. In 15 enucleation or exenteration had to be performed, on account of infection and suppuration of the vitreous. In the former siderosis was observed 9 times: discoloration of iris, pigmentation of retina, cataract with yellow dots on the anterior capsule and hemeralopia, once,

after years, brown discoloration of the cornea. V. concludes that pieces of iron, if they enter aseptically, give a favorable prognosis as to the preservation of the globe, but pieces of stone or copper lead to an unfavorable termination.

Casuistics of Secondary Sensory Perceptions.

KOEPPE. *(ibidem.)* Secondary sensory perception or double perception is the pecularity of some persons to react to a simple sensory irritation with a double sensory perception, e. g., color hearing or color audition. K. perceived a smell of rosin, when hearing a certain melody. He explains it by propagation of the "nervous wave" from one sensory center through the association center to another cortical sensory center.

Experimental Investigations of Infection from the Conjunctival Sac.

ROEMER. *(ibidem.)* Dust is a very important factor in producing infection of the eye. R's. experiments on animals, whose lacrimal ducts had been destroyed, showed that the intact conjunctiva is impermeable for pathogenic organisms. It was only when the germs could enter the nose that infection set in. Numerous experiments with anthrax, septicaemia of mice, chicken cholera, Fraenkel-Weichselbaum's diplococci proved that, with intact tear ducts, the conjunctival sac furnishes an enormously favorable entrance for microorganisms into the lymphatics. This mode of infection deserves the greatest attention in the genesis of cerebrospinal meningitis.

A Case of Bilateral Orbital Phlegmon; Recovery.

LAAS. *(ibidem.)* In a man, aged 21, who opened a furuncle at the root of his nose with a needle, orbital phlegmon on the right side developed with enormous exophthalmus, swelling of lids and intense chemosis. Two weeks later, when admitted to the clinic, the left orbit became affected in the same fashion. Symptoms of cerebral pressure, retarded pulse, vomiting adverted to sinus thrombosis. R. choked disc; incision of upper lid evacuted an abscess of the orbit with decrease of the ophthalmoscopic congestion, but the protrusion did not subside before four weeks after opening of four separate abscesses. Left eye shows, on the sixth day, a yellow subretinal and subchorioidal exudation, which stayed until, on the twenty-first

day, an epibulbar abscess was opened. The retina was reattached after a few days, only some chorioidal changes remained. Discharged after 71 days with V. R. 0.7, V. L. 0.8.

The optic nerves remained intact, despite the violence and long duration of the inflammation. Ulceration of the cornea, so frequently observed, apparently was prevented by keeping the eyes covered constantly by moist dressings. The early evacuation of pus is urgently advised.

Three Hundred Cases of Eye Disease Due to Spinal Trouble.

COHN, DR. HERMAN. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 42, 1902.) Cohn's remarks were made in the course of a discussion upon this subject. He analyzed the histories of three hundred cases which had come under his observation. It must be said, however, that thirty-one of these cases were characterized more by the symptoms of neurasthenia than by those of tabes, but the remaining two hundred and sixty-nine were undoubtedly tabic in origin. Among these latter, one hundred and twelve had atrophy of the optic nerve, seventy-one had pupillary rigidity and seventy had paralysis of the eye muscles. What is very remarkable is the fact that syphilis was demonstrated as the undoubted cause in only thirty-four cases. He is a strong opponent of the view that syphilis is the principal cause of tabes. It is interesting to compare the muscular paralyses in these cases with those due to other causes. Among one hundred thousand patients, he observed eight hundred and forty-three paralyses of eye muscles, and in comparing the cases in which the trouble was luic in origin with those in which the etiology was different, he found no difference as regards the frequency with which one muscle was affected. He speaks despairingly of the treatment in this class of cases. The electric current, either continued or interrupted, and all the various internal medicaments give no satisfaction. The inunction treatment, he thinks, if anything, does more harm than good. He has gotten the best results from inhalations of nitrite of amyl and from subcutaneous injections of strychnine.

Adrenalin.

KIRCHNER, DR. HANS. (*Die Ophthalmologische Klinik*, No. 12, 1902.) The author gives us a history of the drug

and then proceeds to the practical part of the communication. He takes a solution of adrenalin hydrochlorate 1:1,000 and dilutes to the proper strength. The dilution should always be made with sterilized water or, better still, with sterile salt solution; and the solution of adrenalin should always be kept in a black bottle. He has found the agent valuable in the treatment of marginal ulcers of the cornea of catarrhal origin. It greatly ameliorates the irritative symptoms seen in all conjunctival inflammations. In this connection he reports the case of an old woman whose conjunctivæ, for a long time, had been so sensitive that she could not tolerate the simplest collyria, and who experienced permanent and entire relief from the instillation of adrenalin. He has found the use of adrenalin of signal advantage in the glaucomatous eye, and he reports a case of glaucoma in an old woman in whom the usual local remedies had failed. The conjunctivæ were swollen, suggesting trachoma, and there was ectropion of both lower lids. The pupils showed no response to miotics. Adrenalin was at once employed, and with astonishing results. In four days the conjunctivæ had entirely changed their appearance and the pupils had responded to eserin, which had been combined with the adrenalin. A corneal ulcer, which was also present, had completely disappeared. He strongly advises its use in operations upon eyes which are intensely congested, and in such cases, of course, it should be combined with cocain.

Dionin.

GOTTSCHALK, DR. (*Wochenschrift für Therapie und Hygiene*, des Auges, Mo. 48, 1902.) The author reported, some time ago, a rather interesting fact resulting from a number of observations of cases of atrophy of the optic nerve treated by heat. He observed that not only was the color sense in these cases improved, but that the visual acuity was increased. This he attributed to the effect of the high temperature upon the circulation acting as a stimulant. Dionin, as we know, exerts pretty much the same effect upon the lymphatic circulation. He reports a case of retrobulbar neuritis where the dionin treatment was employed. The patient was a shoemaker, thirty-two years old. On the 6th of July, 1902, the vision of both

eyes was five-tenths, with marked defects in the color sense. Ophthalmoscopically, there was a slight hyperemia of the papilla. The patient had recently exposed himself to the vicissitudes of weather, and a diagnosis of retrobulbar neuritis was made. Treatment with dionin was begun and an instillation of a drop of a 2 per cent. solution was made. The improvement in both visual acuity and color sense was marked. Unfortunately, the patient disappeared and the treatment was interrupted. The author thinks, however, that the result is very suggestive and that the agent may be a useful adjunct in the treatment of optic nerve atrophy.

The Action of Dionin Upon the Corneal Scars Left by the Pannus of Trachoma.

Von Arlt, Dr. F. R. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 35, 1902.) The communication of von Arlt is a very short one, and is simply a report of several cases of pannus following trachoma, where, in addition to the treatment of the trachoma with sulfate of copper, applications of dionin were made twice a week. About 0.005 g. were put in the lower conjunctival sac and gentle massage was kept up for several minutes. Two very striking results were recorded.

Paralysis of Eye Muscles after Severe Hemorrhage.

Neuberger, Dr. S. (*Centralblatt für praktische Augenheilk*, June, 1902.) The case reported was that of a young woman who had long suffered with stomach trouble which proved to be due to an ulcer. She was prostrated by a severe hemorrhage and was unconscious for some time, and only gradually came back to health. Soon after recovering consciousness she saw double, and this condition persisted. Apart from the stomach trouble, she was perfectly sound. There was marked divergent strabismus. She was put on nourishing food and faradism, and a year later she was again seen and was in blooming health. The absence of any other cause led the author to attribute the paralysis to the hemorrhage from the perforating ulcer of the stomach. He reports another case, in which the patient had lost an enormous quantity of blood from placenta previa. She lay for some time, in a critical condition, and when an examination of her eyes was possible, she was found to have pronounced neuro-retinitis,

and she was also unable to move her eyes upward. As regards the pathogenesis of such cases, the author is of the opinion that we have, in these cases, a neuritis, and in the last case a polyneuritis, for all the motor muscles were paralyzed and, in addition, the hypoglossal and trigeminus.

Ichthargan in Ophthalmology.

GUTTMANN, EMIL. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 36, 1902.) The author calls our attention to a new silver preparation which he has found very valuable in the treatment of certain conjunctival troubles. He compares it with nitrate of silver, largin and protargol and regards it as superior to any one of these. It contains 30 per cent. more silver than either protargol or largin and, though less than nitrat of silver, it is not nearly so irritating. It is a brownish powder, which is readily soluble in water. He treated thirty-eight cases of conjunctivits, seven cases of dacriocystitis, ten cases of trachoma, five cases of ophthalmia neonatorum and one case of serpent ulcer. It was used in the strength of two grains, five grains and ten grains to the ounce of water. The instillation is not attended with any pain. In several cases it was used once daily for six months without any unpleasant effects. There is no argyrosis. Its effects, while beneficial in ordinary conjunctivitis, were not specially striking. It was not as satisfactory in the cases of ophthalmia neonatorum as nitrate of silver. It did not seem to have any beneficial effect upon the serpent ulcer. In severe cases of dacriocystitis it was found useful, but is probably inferior to other agents. Its chief use, however, is to be found in trachoma, and especially in pannus of trachomatous origin, and it seems to have actually a specific influence upon this corneal condition.

The Etiology of High Grades of Myopia. A Clinical Study.

GUTTMANN, DR. E. (*Archiv. für Ophthalmologie*, LIV. Band, 2. Heft.) Guttmann's communication is a most interesting and valuable one and is based upon a study of 3,688 cases of myopia treated in the clinic of Professor Magnus from April 1888 to March 1902. He discusses these cases with reference to gender, age and occupation, in fact from every point of view and compares his tables with those of other observers. He finds that myopia of

six dioptres and over constitute about 27 per cent. of all myopia cases and 2.1 per cent. of all eye troubles. The high grades of myopia are found among men to the extent of 36 per cent. and among women to the extent of 64 per cent. Three-fourths of the cases of high myopia belonged to the so-called true myopia, while only one-fourth was found in individuals who from the fifteenth year had engaged in strenuous near work. In that variety of myopia resulting from the character of the occupation the sexes were equally affected, while in the genuine variety there were twice as many women as men. Of the high grades of myopia among men one-third could be traced to near work, while among women only one-fifth could be traced to this cause.

The tendency to true or genuine myopia is twice as strong in women as in men and this is the case even up in the high grades as ten dioptres and over. The highest grades of myopia were found notably less often among men who were engaged in near work than among those with true myopia, in other words the so-called "occupation myopia" more rarely reached ten dioptres than the true form. Ophthalmoscopic changes were found in 22 per cent. of all the high grades, the women being twice as much disposed to this complication as the men. The changes most often seen were usually found in the macular region and seldom was retinal detachment observed. The greatest number of complications were found after fifty. In the case of high grades of true myopia in men complications were seen twice as often as in high grades of occupation myopia. More than two-thirds of the cases showed no hereditary tendency to myopia.

A Remarkable Case of Spasm of Accomodation in an Hysterical Boy.

LOESER, DR. (*Centralblatt für praktische Augenheilk.*, June, 1902.) Four years previously the boy had trachoma of which he had been cured after a few months treatment. He complained of headache, vertigo and tinnitus. He could not recognize persons on the street and had to hold things close up to his eyes in order to see them. The subjective examination showed the ability to count fingers in one-half m. with naked eye.

Right eye with concave 22 D. Vision equal to five-tenths.

Left eye with concave 24 D. Vision equal to five-tenths. There was some narrowing of the visual field. Loeser had made up his mind that he was dealing with a case which would require radical operation for myopia, but when he came to the ophthalmoscopic examination (while the eye was under a mydriatic), the boy was found to have a hyperopic astigmatism of 2.50 dioptres in the right eye and 1.50 dioptres in the left eye. These glasses were ordered and in the course of time all his uncomfortable symptoms disappeared.

Diagnostic Value of the Large Electric Magnets.

GELPKE, DR. (*Klinische Monatsblätter für Augenheilk.*, July, 1902.) Gelpke is a warm friend of the large magnets, but deplores the fact that the possession of one calls for so big a pecuniary outlay. This fact prevents many from getting one. He prefers the Volkmann magnet which possesses practically all the advantages of Haab's magnet and is much cheaper and more easily handled. He relates a case which illustrates the value of the large magnet as a diagnostic agent. The patient was a man who complained of bad vision in both eyes, especially in his right eye. A minute prominence was seen in the right eye in the region of the equator with the ophthalmoscope. He remembered that seven years previously a piece of steel had flown into that eye. He was treated at the time and apparently got well, the presumption being that the piece of steel had not penetrated the eyeball. Gelpke tried the sideroscope, but with negative result. He then brought Volkmann's magnet up to within 5 cm. of the eye and he could distinctly see with the ophthalmoscope a slight bulging forward of the prominence of the eye. It is sufficient to say that an incision was made and the piece of steel (which it proved to be) was removed. The eye recovered without any irritation and with vision unimpaired by the operation.

The Operative Treatment of that Form of Squint which Is Complicated with a Rotation of the Eye About its Axis.

KOSTER, PROFESSOR. (*Zeitschrift für Augenheilk.*, July, 1902.) The author gives us an historical sketch of the operative treatment of concomitant strabismus and states how comparatively easy it is nowadays to correct this condition. In contrast, however, stands out the treatment of that variety which follows paralysis of one or more of the

muscles, for in these cases in addition to the lateral or to the vertical deviation as the case may be, we have also a rotation of the eyeball about its axis. Such cases require careful study before operative interference should be undertaken, for example the position of the double image must be carefully studied and note must be taken whether the relative position of these double images remains the same which ever way the eye looks, and in the usual positions of the head, also whether the angle of squint of the lateral and of the vertical deviation as well as the turning of the eyeball about the corneal axis remains constant with all the movements of the eyes and if this is the case one can hope for success from operative measures. This variety of squint, according to Koster, finds no name in literature and he suggests the name of strabismus rotatus. He mentions the difficulties which attend operations of this character upon patients affected with this variety of squint and describes an operation which he has usually employed. His conclusions are as follows: This variety of squint can be successfully operated upon as soon as the paresis is entirely cured. Marked malpositions of the eye can be corrected by means of tenotomies and by shortening the muscles. The rotating squint must be principally corrected in the eye in which it exists. In the cases of convergent and divergent squint as well as in the strabismus sursum or deorsumvergens both eyes can be operated upon though in this class the field of fixation must be carefully studied. In order to preserve the revolution of the eye about its axis one can either shorten the inferior rectus or do a tenotomy of the superior rectus in order to get temporal rotation and inversely when we want to get rotation toward the nose. Sometimes it may be wise to perform tenotomy of one of the straight muscles at the same time cutting through Tenon's capsule on one side of the tendon, parallel to the limbus of the cornea and on the side in the direction of which the eye is to be rotated. One can also change the insertion point of one or more of the straight muscles in a direction opposite to that of the intended version. This last method is especially indicated in the squint which is seen after paralysis of the superior oblique. The author here gives detailed information as to how this should be done and with what precau-

tions. In order to get complete correction constant tests should be made with double images.

Extraction of the Crystalline Lens in High Grades of Myopia.

VOIGT, DR. (*Archiv. für Ophthalmologie*, LIV. Band, 2. Heft.) The author analysis a large number of cases which for the most part were operated upon in the Leipzig eye clinic where he was formerly an assistant. The chief objections to the method (as opposed to discission) are according to Blumenthal greater danger of infection, difficulty in removing the lens masses, danger of iris prolapse, of increased intraocular tension and the necessity for a longer time in bed. Voigt discusses these points and comes to practically these conclusions: In the first place the eye must show with the ophthalmoscope a myopia of over 15 D. It is necessary too that the macular region should be intact, and that the vitreous cloudings be slight. While foci of chorioidal inflammation in the vicinity of the macular region and of the papilla do not necessarily form a contraindication for the operation, the prognosis is naturally more unfavorable.

The duration of healing is shorter with extraction of the lens than with discissions and the danger of infection is less. The vitreous body is not exposed to great danger. Elevations of intraocular tension are exceptionally observed. Discission of the secondary cataract is only to be performed when lens masses which are left behind are no longer capable of resorption. The fact that a capsular membrane is sometimes found later on does not make the prognosis of this operation worse. Both eyes should be operated upon and the feebler eye first. If one eye from some cause or other be lost, say from detachment of the retina, the other eye should only be operated upon at the urgent demand of the patient. The danger of detachment of the retina is not increased by this operation and finally a progress of the myopia in the operated eye was never observed. For these reasons then extraction of the lens in high grades of myopia is preferable to discission.

The Introduction of Iodoform Into the Vitreous Body of the Human Eye.

WOKENIUS, DR. HUGO. (*Zeitschrift für Augenheilk.*, August, 1902.) The author analyzes and discusses three

cases of penetrating wounds of the eyeball in which there was an opening into the vitreous body. Twice the wound was in the ciliary region and once in the cornea and in the latter case the lens was injured. Independently of the surgical treatment the iodoform (pure) was introduced into the vitreous body by means of a glass trochar. This method was chosen as Ollendorf had shown that under these circumstances the iodoform was absorbed while Haab's iodoform rods and Wüstefeld's discs are incapsulated and sometimes lead to retinal detachment. The results did not bear out entirely Ollendorf's experiments on animals, but it can not be said that they differed very materially. The iodoform was entirely absorbed in the course of time, it requiring several weeks for this to happen.

Sight was saved in every case though, of course, it was much impaired. The author concluded that the introduction of pure iodoform into the vitrous body does not exert an injurious effect upon the eye. In fact he advises this method of disinfecting the interior of the eyeball in penetrating wounds of the latter. The quantity of iodoform introduced was generally about the size of a pea.

A New Operation for Conical Cornea.

Hirschberg, Dr. J. (*Centralblatt für praktische Augenheilk.*, July, 1902.) Hirschberg describes an operation which is based upon the practice of A. v. Graefe who was in the habit of cauterizing the apex of the conical cornea, producing in this way a certain amount of flattening out of the tissue in this locality due to the contraction of the scar. Von Graefe was in the habit of removing with the knife at this point a thin piece or layer of corneal tissue and then cauterizing this point with nitrate of silver Hirschberg, however, gets his scar by touching the apex of the conical cornea with a metal point, which is heated to red heat in a spirit lamp and then allowed to cool till the red in the heat has disappeared. He produces an ulcer of 1.5 mm. in diameter. In ten days this operation is repeated, in fact the operation is repeated from three to four times. He makes it a rule to tattoo the scar left by the cauterizations. By this method he gets a flattening out of the excessively curved cornea. He has raised vison from one-tenth to one-fifth and has been employing

the method for twenty years and has never seen injurious results.

Chorioidal Atrophy in the Myopic Eye

SALZMANN, DR. M. (*Archiv. für Ophthalmologie*, LIV Band., 2 Heft.) The author describes, at length, the anatomical changes in this affection and goes thoroughly into the pathogenesis of chorioidal atrophy as seen in the myopic eye. All this may be omitted, and only that part which touches upon the treatment will be mentioned. He thinks that chorioidal atrophy is a direct result of the myopia, and not simply an accidental complication. As regards the treatment, the first thing is to lower the tension upon the chorioid, and this can only be done by lowering intraocular tension. He speaks of the myotics and discusses their indications. He thinks that corneal puncture is a valuable measure, but is unsuitable for general use. Resting the eyes is of great value, and this measure is evidently often utilized by him. He mentions subconjunctival injections of hydrarg. cyan. He regards the operation upon the lens as pre-eminent among therapeutic measures and as being most apt to bring about a permanent establishment of lowered intraocular tension. He dwells upon this last measure at length, but adds nothing of special importance.

Anatomical Changes in the Optic Nerve in Brain Tumors and the Pathogenesis of Choked Disc.

LIEBRECHT, DR. (*Zeitschrift für Augenheilk.*, September, 1902, pages 391, 392. Report of Heidelberg Ophthalmological Congress.) The conclusions which Liebrecht draws from an anatomical examination of fourteen eyes are as follows: 1. Choked disc and the optic neuritis which follow brain tumor are two separate things. Choked disc is caused by a stasis of the lymph in the optic nerve and, as such, there is no evidence of inflammation. Only when the nerve at the bulbar end is attacked by an interstitial inflammation will we find inflammatory changes in the papilla. Brain tumors lead very early to an inflammatory condition of the sheaths of the nerve and, secondarily, to an interstitial neuritis and, finally, peripheral commencing atrophy of the constituent nerve elements. Choked disc can make its appearance before or after inflammation of the nerve. Generally the

earliest and most intense inflammatory symptoms are seen in the region of the optic canal and, later on, in the vicinity of the eyeball. The most pronounced degenerative changes are found, as a rule, in the region of the optic canal, and upon these changes depends the intensity of the functional disturbances. A choked disc, which is simply an edema, can last for a long time without causing any functional disturbances. The lymph in the optic nerve is not inflammatory, but is induced by compression of the veins and lymph vessels at the points where they pass through the sheaths. Lymph stasis was found in all cases of choked disc, and this was more marked in cases where the inflammatory changes in the nerve were comparatively slight. The participation in the elevation of the papilla, on the part of the lamina cribrosa, is rather secondary in character.

The Source of the Aqueous Humor.

HAMBURGER, DR. (*Ibid.*, page 399.) This old question is again dragged out. Hamburger is of the opinion that Leber's views are erroneous. It will be remembered that Leber held that the aqueous is secreted by the ciliary body. Experiments with fluorescein have led Hamburger to conclude that the aqueous humor proceeds from the anterior border of the iris, and not from the ciliary body.

Further Investigations Relative to the Serum Therapy of Serpent Ulcer.

ROEMER, DR. (*Ibid.*, page 365.) The author has had exceptional opportunities for observing serpent ulcer. His work confirms the observations of Uhthoff and Axenfeld, and he finds the pneumococcus in ninety-five per cent. of cases of serpent ulcer. He experimented with his pneumococcus serum in eight cases of beginning serpent ulcer, and all the cases were cured by this treatment. He thinks he is justified in hoping that the timely employment of the serum will prevent the development of the serpent ulcer —in other words, that we now have at our command a specific prophylactic measure for the treatment of this variety of corneal trouble.

Collargol in Ophthalmology.

WOLFFBERG, DR. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 50, 1902.) This drug was first em-

ployed by Daxenberger and Schanz. The latter employed the agent in a 2 per cent. ointment. He reports a case of intense gonorrheal ophthalmia where itrol ointment, protargol—in fact, all the usual remedies—were tried and the eye kept on getting worse. The collargol treatment was instituted when the cornea commenced to be involved. Every hour some of the ointment was introduced beneath the upper lid and allowed to melt and flow over the eyeball. Gentle massage was practised on the lid. The improvement was uninterrupted, and the only setback occurred when the collargol was omitted for a few days; on its resumption, however, recovery followed.

The Influence of Climate Upon the Outbreak of Acute Inflammatory Glaucoma.

STEINDORFF, DR. (*Centralblatt für praktische Augenheilk*, August, 1902, page 238.) In Hirschberg's clinic from May, 1885, to May, 1902, there were one hundred and three cases of acute inflammatory glaucoma treated. Of these, sixty-five attacks happened between September 1st and March 31st and thirty-seven in the summer months. More outbreaks were seen in December and January and the least number was seen in June. Generally, in speaking of this disease, the influence of climate is rarely mentioned. Hirschberg has long maintained that attacks of acute glaucoma are more frequent in the winter months. The author has studied closely the observations which were made in the Prussian Meteorological Institute with reference to the dates of the attacks, and he found that temperature conditions had probably more to do with attacks than simply dampness, atmospheric pressure and high winds, which latter series of phenomena probably had no etiological significance.

Phlyctenular Conjunctivitis.

LEBER, PROF. (*Centralblatt für prakt. Augenh.* August, 1902, page 244.) According to Leber, the relationship which exists between this disease and scrofula cannot be disputed. The difficulty is that we cannot prove this, for we do not know precisely the nature of scrofula. The explanation that the disease is an eczema is unsatisfactory, for we are still in the dark about eczema of the skin. The eruption of little vesicles seen in phlyctenular conjuncti-

vitis is the result, in large measure, of the eye inflammation. The author has made careful examination in a number of cases, and he fails to find a bacterium which can be regarded as the specific cause of the affection. In none of the cases was there any formation of vesicles, but there was always cell infiltration; in other words, little nodules which consisted of small cells, but also, to some extent, of large cells, even of giant cells. There was no evidence of either caseation or of tubercle bacilli, but there was certainly a resemblance in structure to what we are accustomed to find in a tuberculous process and the scrofulous origin is very likely. Leber thinks that the inflammation is probably caused by the absorption into the blood of toxins from dead tubercle bacilli. Experiments by injecting dead bacilli into the cornea and conjunctiva caused local inflammations.

The Indications for Resection of the Sympathetic in Glaucoma.

HOOR, PROF. KARL. (*Archiv für Augenheilkunde*, August, 1902.) The author is of the opinion that, in acute glaucoma, resection of the sympathetic is out of place unless iridectomy has been declined or unless, after a performed iridectomy, the disease either persists or relapses, and finally when sclerotomy has proved of no avail. Under such conditions, the operation may be performed and, later on, supplemented with another iridectomy. The operation, without any preliminary iridectomy, may be done in cases of glaucoma simplex when there is much visual disturbance, and especially when there is much narrowing of the field, for in such cases his experience has convinced him that iridectomy is of no avail. In these cases he is rather more inclined to sclerotomy than iridectomy, if he had to choose between these two operations.

Spring Catarrh.

FALTA, DR. MARCZEL. (*ibid.*) The author gives us a short historical survey of this interesting affection and discusses its clinical aspects. It can not be said, however, that he adds anything new to its etiological aspect. Of especial interest is the diagnosis and the author describes how spring catarrh may be differentiated from phlyctenular conjunctivitis, episcleritis, and trachoma. As regards the diagnosis he lays especial stress upon the his-

tory. He thinks that the itching is a most important symptom and when present in warm weather the disease is almost certain to be spring catarrh, so that he makes it a rule always to ask the parents of the children whether the latter rub the eyes a great deal and a positive answer fixes the diagnosis of spring catarrh. He calls attention to a point which is new. If the lid of the affected eye is rubbed briskly over the latter or after everting the lid, we rub the granulations over with a glass rod, the patient will complain of great itching. This is a point which serves to differentiate the disease from trachoma. In the latter disease, if the rubbing process provokes any disagreeable sensation at all, it will be one of pain rather than one of itching. He confesses that the therapy of spring catarrh is as unsatisfactory as ever and when he discusses this aspect of the question he is travelling over a well known and barren field.

The Preparations of the Lids and Cilia for Operation Upon the Eyeball.

Von Pflugk, Dr. A. (*Archiv. für Augenheilk.*, July, 1902.) The author's conclusions may be summed up as follows. The cilia of the normal eye are, with few exceptions, covered thickly with bacteria. Washing the edges of the lids and the cilia with sterile water and soap does not lessen to any great degree the number of bacteria on the cilia. Frequent washing the edges of the lids and cilia with a little rag or mop dipped in benzin will free the cilia of the germs which may be clinging to them and the same may be said of the other members of the same group of agents, i. e., alcohol and ether, but these two agents are not so applicable, because they are more irritating. Since it is possible to free the cilia of the germs, it is, of course, unnecessary either to epilate or to cut off the cilia.

Ophthalmoplegia Interna of Both Eyes Produced by Taking Extract of Ergot.

Schneider, Dr. P. (*Münch. med. Wochenschrift*, No. 39, 1902.) The patient had complained for several days of inability to read and had been compelled to use a strong convex glass in order to accomplish any near work. While he could see well in the distance everything appeared red. Generally his symptoms would disappear toward the after-

noon. The objective examination revealed large pupils and only slight response to light and convergence and the accommodation was practically abolished. The motor muscles were intact and the ophthalmoscopic examination was negative. A careful examination revealed absolutely no constitutional affection. It turned out, however, that for some time past he had been taking morning and evening two grammes of extract of ergot at a dose. At one time he had had slight trembling in his limbs, but these were the only symptoms, with the exception of his bad vision. It may be said in conclusion that his symptoms disappeared entirely as soon as the ergot was taken away from him.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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Hyperoidized Oil in Ocular Therapeutics. (Iodopin and Lipiodal.)

BELLENCONTRE, Paris. (*La Clinique Ophtalmologique*, 25th July, 1902.) Hyperiodized oil, Bellencontre tells us, is a new stable combination of iodin and the fatty acids in which the iodin is fully concentrated. The drug, while possessing all the therapeutic qualities of iodin, has not any of its disadvantages. It is colorless, almost tasteless, and is well borne by the digestive tract.

Its main advantage, however, the author states, is in the possibility of its hypodermatic use in large doses without the production of pain or iodism. Iodipin contains from ten to twenty-five per cent. of iodin, while lipiodal contains forty per cent. Except for this difference in strengths he has found that the action of these two materials is the same. During the hypodermatic administration of the drug there is usually an increase in weight of the patient. When it is taken internally mild symptoms of iodism occasionally follow and the increase in weight is less constant. Absorption of the material is rapid, free iodin being found in its inorganic form in twenty minutes time after ingestion of the drug. In infants the hypodermatic dose is 1 gramme daily; while in adults it is from five to ten grammes. The two drugs should be used proportionally.

They should be given in ascending doses, a child of two to five years of age receiving at the end of thirty days a total amount of thirty grammes.

The therapeutic indications are the same as those for iodid of potassium. In interstitial keratitis, scrofulous ocular troubles, descemetitis, and iritis of doubtful origin, the drug has been employed with great benefit. In the treatment of eye complications of tabes dorsalis by it very little results have been obtained by the author. In one case of traumatic hyaloiditis, improvement was rapid during the use.

Employed locally, both iodin and lipiodal diluted with four parts of an aseptic oil were used without discomfort to the patient, but without any apparent useful result in the disease—an infectial corneal trouble. Subconjunctival injections are well borne, the average dose being about ten drops.

The Cure of Detachment of the Retina by Subconjunctival and Intracapsular Injection of Salt.

DeWecker, Paris. (*Annales d'Oculistique*, August, 1902.) DeWecker does not believe that intraocular injections of salt can be made at will. The anatomical variations in the capsule, and even the demonstration of its complete absence, support, he says, his views, as against those which have been advanced by both Dor and son. He does not believe that the method of subcapsular injection has been properly made, unless bosselation of the conjunctiva occurs near the tendinous insertions of the muscles; otherwise fearing mere penetration into the fatty tissues of the orbit.

The curative action of these injections he finds are in direct proportion to their degrees of concentration. Increased concentration produces more pronounced pain, the maximum painless strength being two per cent. By using the fluid part of the vitreous body of animals as a solvent, strengths of even thirty per cent. of the drug may be obtained; the injections of which produce but little pain. The effect of the injection, he says, is to establish an outward motion of the intraocular currents, thus tending to remove the subretinal fluid. This explanation of the mode of action he knows is not accepted by some writers, notably, Dor and son, but in contra-distinction to their belief, he

thinks that the efficacy of the operation and not the interpretation of its action as, for example, the question of the effect of iridectomy upon glaucoma, is the essential point of practical value.

On the Danger of Conservation of the Ocular Stump: Consecutive Sympathetic Ophthalmitis.

GALEZOWSKI, Paris. (*Recueil d'Ophtalmologie*, July, 1902.) Galezowski writes a vigorous protest against the preservation of atrophic ocular stumps and any attempts to make them presentable by tatooing. He likewise disapproves of any efforts to obtain esthetic results by conservation of a part of the globe with the placing of glass balls, etc., in its interior. These plans, he says, are illogical, and may seriously compromise the fellow eye by producing sympathetic ophthalmitis. He reports a case in which several months after an injury to the left eye by a grain of lead with subsequent atrophy, sympathetic inflammation with cataract developed in the fellow eye. Enucleation of injured organ was immediately performed. Later a corrected vision of normal was obtained by combined extraction of the cataract of the sympathizing fellow.

Preliminary Iridectomy in the Operation for Senile Cataract.

AUBINEAU, Brest. (*La Clinique Ophtalmologique*, 10th July, 1902.) For three years past Aubineau has employed preliminary iridectomy in his operations for senile cataract. By this method, he says, incarceration, hernia of the iris, and irido-chorioiditis are much less frequent, and much less deleterious when they do occur. The preliminary operation is made fifteen days in advance of the extraction.

Rigidity of Convergence: A Functional Trouble which has not yet Been Described in Neurasthenia and in Hysteria.

KOENIGSHOFER, Stuttgart. (*La Clinique Ophtalmologique*, 10th July, 1902.) Spasm of convergence, insufficiency of the internal rectus muscles, and both spasm and weakness of accommodation are known phenomena of hysteria and neurasthenia. Cases in which these symptoms are simultaneously present, however, are more rare.

Such a case, he says, complains of a dull pain in the front and back of the head which is not relieved by rest. The patient is unable to see an object distinctly at any

distance, vision always being rendered more indistinct during attempts at fixation. In the most accentuated type of cases a feeling of vertigo is caused by walking, especially upon paved sidewalks.

Five cases are reported, in all of which homonymous diplopia for distance and crossed diplopia for near were present. There were also moderate degrees of spastic myopia upon fixation. The direct cause in all the cases, the author believes, is an excessive use of the eyes. In all of his cases he established a therapy which was directed against the general neurosis, combining the local use of atropin with it.

Retrobulbar Neuritis In a Case of Anchylostomiasis.

INOUYE, Tokio. (*La Clinique Ophtalmologique*, 25th June, 1902.) Inouye reports a case of retrobulbar neuritis occuring in anchylostomiasis, in which prompt relief of the only ocular symptom—diminution of vision—followed the removal of the intestinal affection by the use of thymol; iodid of potassium, however, had been previously administered with some relief. The nature of the relationship between the two conditions, whether reflex or toxic, has not yet, the author states, been determined.

Pathogenesis and Treatment of Glaucoma.

ZIMMERMANN, Stuttgart. (*La Clinique Ophtalmologique*, 25th June, 1902.) Zimmermann believes that glaucoma is not an intrinsic disease of the eye, but that it is rather a symptom of general organic defect which is characterized by a diminution of the blood pressure. The treatment based on this condition, he says, best consists in the administration of cardiac stimulants and the use of strophanthus. He has treated forty cases of various forms of the condition by this method with excellent results.

On a Case of Post-diphtheritic Paralysis of the Accommodation and Convergence.

GINESTOUS. (*Annales d' Oculistique*, August, 1902.) In an analysis of one hundred and forty cases of post-diphtheritic paralysis of accommodation, Moll, the author says, has found that spontaneous and permanent cure has, as a rule, resulted in four weeks' time. Ginestous details the history of the following case: A nine-year-old girl had diphtheritic angina in April of 1900. Under the serum treatment, she recovered and left the hospital. She then

became affected with paralysis of the soft palate in association with difficulty of seeing to do near work. The ocular troubles continued until January of 1902, when she was studied by the author. At that time there were but two diopters of accommodation, with a three and a half meter angle of convergence, present. The pharynx was normal, as were the limbs. Urine was negative. A culture made from the throat showed the presence of the staphylococcus alone. Electrotherapy was given without any result. Hypodermatic injections of serum effected a rapid cure. The duration of the paralysis and its rapid removal by the serum therapy are the interesting parts of his case.

Dionin as an Antiseptic.

WINGENROTH. (*La Clinique Ophtalmologique*, 25th June, 1902.) Wingenroth reports a case of conjunctival blenorrhea due to a mixed infection of staphylococci, streptococci and pneumococci, occurring in an infant of but fifteen days of age. After the failure of other treatment, instillations of one part of cyanid of mercury and twenty parts of dionin to one thousand parts of distilled water were given six times daily, producing a cure in three days' time. Darier, he says, claims the antiseptic action of dionin to be the result of the lymphatic inundation and the lacrimation which follow its use. The author confirms this opinion, and states that the drug has proved of service in a large number of cases.

On Gummata of the Ciliary Body; Particularly of the Ciliary Processes.

PANAS, Paris. (*Archives d' Ophtalmologie*, August, 1902.) Of the various parts of the uveal tract, the ciliary body, Panas tells us, is most often the seat of syphilitic gummata; the number of reported cases, however, is small, amounting to but forty-three. The question may be asked, the author says, whether this variety may not be dependent upon a confusion of the condition with tuberculosis and with so-called spontaneous panophthalmitis? Since, however, he says, ciliary gummata occur as very early tertiary symptoms of syphilis, this mistake is unpardonable. Usually, a ciliary gumma is preceded by a monocular or binocular plastic iritis. The involvement of the iris, whether early or late, begins at its base as a

grayish yellow prominence which is accompanied with a clouding of the aqueous humor and a fibrinous deposit in the pupillary area. Conjointly with these signs, a reddish prominence, situated at a corresponding point on the sclera, appears. Later, this mass assumes a true fungoid appearance. The prognosis of the disease, as of all other precocious tertiary manifestations of syphilis, if combined with a depraved general condition, is grave. However, he says, the condition may be cured, with preservation of the visual integrity, by active specific medication. He reports such a case.

In a second case—one of hereditary syphilis—the local process was cured, but vision was reduced to one-sixth of normal. In a third case, after the failure of all other forms of specific treatment, improvement followed the hypodermatic use of oily solutions of biniodid of mercury. The author prefers the injection method of specific treatment, because of the possibility of exact dosage and by reason of its freedom from unpleasant complications.

On Glaucoma Combined with Subacute Iritis: So-called Insidious Iritis.

PANAS, Paris. (*Idem.*) Panas reports two cases of insidious iritis which undoubtedly were syphilitic in origin, and in both of which glaucomatous symptoms appeared. In the first case there was an almost complete pupillary occlusion from synechia. In the second there were a few adhesions, proving that there is a less intimate relation than has been formerly supposed between large pupillocapsular adhesions and secondary glaucoma. In the second case the glaucoma, as well as the frequent attacks of hyphemia, were ascribed by him to the action of the syphilitic virus on the vascular walls.

Wounds of the Eye by Grains of Lead.

VALOIS, Monlin. (*Recueil d'Ophtalmologie*, July and August, 1902.) Wounds of the eye by grains of lead, Valois says, do not differ essentially from those which are produced by other foreign bodies. As a rule, however, infection is less frequent, since grains of lead are usually sterile.

With the danger of infection eliminated, the seat of the wound is of more importance than the form of the penetrating object. The author reports two cases of ocular

injury by lead shot in which, they, after passing through the ciliary region, lodged in the orbit. The immediate effect of treatment was good, both eyes becoming quiet. In each case, however, an iridochorioditis developed in a few weeks' time, for which it became necessary to perform enucleation. In such cases he tells us that Yvert has urged against enucleation as well as any attempts for removal through a scleral opening. Valois admits the localized value of radiography in such cases, but he insists on the great importance of wounds of the ciliary region, and whether the foreign body is situated within or without the eye; this being true, since the former type of wound is almost always followed by cyclitis or, even, sympathetic ophthalmitis. The primary treatment of such wounds, he says, is similar to that which should be established for those received from any form of material. For any repeated attacks of cyclitis, which so often occur, he feels that he cannot urge enucleation too forcibly in preference to any conservative or temporizing method.

Mode of Cicatrization of the Capsule of the Crystalline Lens After Wounds of This Membrane.

TERRIEN, Paris. (*Archives d' Ophtalmologie*, July, 1902.) Terrien has succeeded in producing wounds of the lens capsule, without a resulting cataract, in the eyes of several dogs. From the histological study of these cases, he concludes that true reparation of the capsular membrane does not take place after its injury, cicatrization being accomplished entirely by the subcapsular epithelium.

Traumatic Scleral Rupture.

PANAS, Paris. (*Archives d' Ophtalmologie*, July, 1902.) Panas reports two cases of traumatic scleral rupture. The first was in an eighteen-year-old male who received a blow on the external angle of the orbit from a stone the size of a hen's egg. Marked ecchymosis followed and, later, inflammatory symptoms developed. Two months after this, vision was reduced to light perception; the globe was soft, tender and congested, while at the lower inner corneal limbus there was a semilunar rupture of the sclerotic, with a typical staphyloma and displacement of the iris and lens. Operation was refused.

The second case was in a female aged twenty-three years. In her case there was a large, gaping tear, in-

volving the superior quadrant of the scleral limbus, through which the iris was prolapsed. The overlying conjunctiva in this situation was also ruptured.

There were no subjective symptoms other than blindness of the eye, and there were not any objective signs of inflammation or ecchymosis. Under chloroform, the iris prolapse was excised and the conjunctival and scleral wounds were closed with sutures.

The author reminds us that Müller, in a monograph, has collected a great number of cases of scleral rupture. In almost all of them the rupture involved the sclero-corneal limbus and was usually semilunar in shape, rarely involving more than a fourth or a third of the same. An oblique or meridianal direction of the wound was found to be rare.

He tells us that the majority of ruptures occur in the superior half of the eyeball, while the conjunctiva, owing to its mobility, is rarely torn. The iris is constantly prolapsed and the lens is often displaced. Hemorrhage into the anterior chamber, or a conjunctival one, is frequent. Intraocular tension is always reduced. Subjective symptoms, especially those of reaction, are rare. Acute inflammation is seldom noted. As a rule, the rupture is the result of blows from blunt objects.

The majority of ruptures of the inferior portions are the results of penetrating objects. The seat of rupture is almost constantly that which corresponds with the canal of Schlemm and, as a rule, is due to contre-coup.

When the blow is received directly upon the anterior pole of the eyeball, the cornea may give way before the sclerotic; the tear, however, on reaching the latter, immediately takes the course of Schlemm's canal, thus producing one which has a T or an L shape. Rectilinear wounds are, therefore, he says, evidences of the use of a cutting edge. In rare cases scleral rupture is incomplete. Vision is always seriously compromised. Sympathetic inflammation is frequent, and grave: of this sequel, the author reports a case.

The treatment of scleral rupture, he says, consists in cold applications, irrigation with one to five hundred strength solutions of methylene blue, combined with the

use of iodoformed vaseline or oil. Scleral suture, he states, is indicated only in widely gaping wounds.

The author briefly reviews the literature of traumatic enophthalmus and reports a case, for the explanation of which he advances the theory of a dystrophy of the vessels of the orbit and a subsequent atrophy of the orbital fat. The prognosis, as to vision, in this condition he believes is, as a rule, not grave, although the results of treatment for the relief of the condition are very unsatisfactory.

Spinal Syphilis Simulating General Paralysis. Jacksonian Epilepsy; Dysarthropy; Ocular Palsies; Important Semilogical Value of the Ocular Disturbances.

BRISSAND and PECHIN, Paris. (*Archives d'Ophtalmologie*, August, 1902.) The following case reported by Brissand and Pechin is considered important on account of the difficulty in obtaining a correct interpretation of the symptoms. A forty-three year old man who had been both intelligent and active, contracted gonorrhea and syphilis some twenty years previous. In July of 1898, after having had a headache which was limited to the left temporal region for a few weeks time, he noticed that a mist of sufficient degree to keep him from reading appeared before his eyes. At the same time he had an attack of scintilating scotoma. These symptoms were rapidly followed by the appearance of a Jacksonian epilepsy. For several weeks following this he, except for the cephalalgia, enjoyed good health. During the next few months he developed right brachial aura associated with mirror writing, this being followed by a second epileptic crisis. A third and fourth exacerbation were followed by aphasic symptoms. A fifth crisis, which was preceded by an auditory aura ensued. The aphasic disturbance continued. After a seventh epileptic seizure the patient was studied by the authors.

He appeared to understand with difficulty what was said to him though his speech was unintelligible, resembling that which is typical of general paralysis. The movements of the lips and the tongue were tremulous. When not speaking the facial expression was completely blank. His gestures were slow and tremulous. Writing was impos-

sible. The reflexes were exaggerated and a clonus was present. The pupils were large.and unequal in size.

One year later paresis of the right arm developed. The aphasia, as above described, persisted. Under the use of intramuscular injections of iodized oil rapid relief of the crisis, malaise, aphasia and paresis of the arm, took place, though this was attended with the appearance of the following ocular signs: Sudden diplopia followed by absolute palsy of the sixth pair on the right side, associated with mydriasis and slight ptosis of the same side. The iris reflexes were very feeble. Vision was normal. The eye-ground was healthy. Winking on this side was more frequent than it was on the opposite—which did not present any abnormality. There was a paresis of the right facial nerve with complete deviation of the uvula to the left side. The mental condition seemed normal.

The patient has since returned to his work, performing all his duties in his former customary manner. The pathology of such a case, the authors say, is complex and often appears at variance with the clinical record. They believe that the probable lesion was basilar meningitis of gummatous type or a syphilitic arteritis commencing in the bulbs protuberantical parenchyma, associated possibly with disturbances of the sylvian artery. As to the prognosis, nothing they assert, can be definitely promised since serious vascular changes may occur at any time.

Therapeutic Tests With Some New Products. (Nargol, Cuprol, Jequiritol and Chlorhydrate of Adrenalin.)

DARIER, Paris. (*La Clinique Ophtalmologique*, 19th July, 1902.) Nargol is composed of nuclein with a two per cent. strength of silver. While containing a slightly higher per cent. of silver than protargol, its effect, Darier states, is not any greater, and it has the disadvantages of being less protective and more viscid.

The action of cuprol is painless, and while much less efficient than sulphat of copper, it may be employed in cases in which the salts of silver, zinc and lead have failed. Jequiritol he has found has the advantage over jequirity in that its action is more easily controlled. Even its employment, however, may lead to violent reaction, which, however, may be controlled by the use of jequiritol serum.

Many authors report brilliant successes with its use, which, however, the author has never obtained.

Chlorhydrat of adrenalin has, he says, all of the advantages of the extract of the adrenal capsule, and in addition forms a permanent and powerful solution, the maximum of which should not exceed one to one thousand. Several formulæ are appended, in which this drug in strengths from one to seventy-five hundred to one to fifteen thousand with Cu. Hg., cocaine, sulphate of zinc, or eserine, in accordance with the effect desired, is combined.

The Diagnosis of Granular Conjunctivitis.

MORAX, Paris. (*Annales d'Oculistique*, July, 1902.) Morax replies to the criticism of de Wecker, and bases his diagnosis of trachoma on, first, the presence of the lesions in other members of the family in whom there has never been an acute infection by the Weeks bacillus or by the gonococcus; second, the absence of chronic lesions as the results of acute infection by the Weeks bacillus on the gonococcus (the granular conditions following such types of infection rarely persisting more than a few weeks' time); and third, the histological character of the true granulations, which is quite different from the papillary hypertrophy, which is consecutive to blenorrhagic conjunctivitis.

Extraction of Cataract Combined With Iritomy.

MANOLESCU, Bucaust. (*La Clinique Ophtalmologique*, 25th August, 1902.) Manolescu has always preferred the combined method in the operation for the extraction of cataract. During the past six weeks, however, he has practiced a modification which consists in making the incision in the iris vertically so as to divide the internal sphincter. The after result is usually, he says, an almost round pupil. He has found that prolapse of the iris is no more common than after iridectomy, and that as a rule it involves but one angle of the wound.

Diphtheritic Conjunctivitis With Bronchopneumonia.

DESVAUX, Anvers. (*La Clinique Ophtalmologique*, 25th August, 1902.) After an illness of two days, an eight-months-old child was brought to Desvaux with an enormous swelling of the lids of both sides, resembling that of purulent conjunctivitis. The lids were separated with difficulty, being united by a whitish membrane, which also

covered the entire conjunctiva of the globe and lids. The corneæ were transparent. Irrigation with a one to two thousand strength solution of cyanide of mercury was made and some of the same drug was ordered. The following day a portion of a very adherent membrane was removed. Examination of the removed mass revealed the presence of the bacillus of Loeffler with both streptococci and staphylococci. Two days later, bronchopneumonia developed, and the corneæ became slightly hazy. During the following days, three injections of serum were given and iodoform ointment, with the use of a four-grain strength solution of nitrat of silver, was applied to the eyelids. Improvement was noted from the second day; complete cure resulting in four weeks' time.

Some Observations on the Use of Jequiritol in Ocular Therapeutics.

MAKLAKOW, Moscow. (*La Clinique Ophtalmologique*, 25th August, 1902.) Jequirity, Maklakow reminds us, has long been used in the treatment of granular conjunctivitis, but never extensively employed because of the difficulty in regulating its dosage. The new product, jequiritol, he says, can be definitely regulated in its action and is being employed in the treatment of various corneal affections as well as in trachoma.

The author first used what is known as jequiritol number one, and did not obtain any reaction. The use of number two, however, was followed by marked reaction, which lasted a few days' time. He has employed the drug even in the number four strength, in four cases of trachoma, without producing any reaction. He has also used strength number two in three cases of parenchymatous keratitis. In the first, in the regressive stage, there was a marked improvement after the third attack, vision increasing from light-perception to one-fifth of normal. In the second case, one of corneal maculæ after interstitial inflammation, there was not any improvement; while in the third case, one of progressive keratitis, no improvement of vision could be obtained.

New Observations on Annular Scotoma in Pigmentary Degeneration of the Retina.

GONIN. (*Annales d'Oculistique*, August, 1902.) Gonin has previously reported six cases of annular scotoma oc-

curring in pigmentary degeneration of the retina, and to these he adds the histories of nine others.

Etiologically, he says, one appeared to be the result of malaria, and another of typhoid fever, while the remaining thirteen were most probably due to a congenital condition. In all there was not any history of direct transmission, simply one of collateral heredity. Consanguinity of parents was noted in two cases, in one case the patients being full cousins, and in the other, cousins in the eighth degree.

In none of these cases was there true concentric contraction of the field of vision—a condition which is apparently found only in the more advanced stages of the disease—and which is usually reached at the age of about thirty years. He says that since in pigmentary degeneration of the retina, hemeralopia and pigmentation may be absent, an examination of the visual field alone remains to establish a diagnosis; and if concentric contraction beginning at the periphery only is looked for, errors may be made. He concludes with the following deductions:

First. In pigmentary degeneration of the retina contraction of the visual field is not really concentric.

Second. The abolition of the visual functions manifests itself first in the median zones, and extends inward and outward, sparing for a long time the central and the peripheral fields.

Third. In the majority of cases the peripheral field is effaced before the central portion, but this order may be reversed.

Fourth. The development of a crescentic or an annular scotoma is to be considered an usual rather than an exceptional condition in cases of congenital pigmentary degeneration, and probably also in the acquired forms of degeneration.

Fifth. The presence of the annular form of scotoma is not an indubitable evidence of the syphilitic nature of the affection, since it may appear in cases of pigmentary degeneration in which syphilis has not any part.

On the Prelacrimal Tumor.

CIRINCIONE, Palermo. (*Annales d'Oculistique*, August, 1902.) Cirincione says that within the past two years Jocqs and Rollet have presented communications on peri-

cystic or prelacrimal tumors; the former authority claiming priority of description of this condition and believing that these tumors are secondary to disease of the lacrimal sac; while Rollet considers them to be independent factors, and has attempted to prove anatomically the presence of a prelacrimal synovial pouch.

The author in 1890 reported a similar form of growth and demonstrated the presence of the tumor, together with integrity of the lacrimal sac on the cadaver.

The differential diagnosis of these growths from those which are due to involvement of the lacrimal sac, Cirincione says, is difficult, especially in the latter stages. The mobility of the tumor except when it is large, is the principal diagnostic point, a distended lacrimal sac being fixed. In both conditions there may be lacrimation and conjunctival catarrh. Another condition which closely resembles disease of the lacrimal sac is caries of the nasal process of the superior maxillary bone. In the first case reported by the author a large swelling had formed at the internal angle and had all the appearance of a lacrimal sac tumor.

In another case—that of a young man suffering with tubercular ulceration of the skin, there were all the symptoms of acute dacriocystitis on each side. Examination, however, revealed permeability of the lacrimal ducts, and operation proved the presence of caries of the osseous walls.

The Oily Collyria.

TERSON, Paris. (*La Clinique Ophtalmologique*, 25th August, 1902.) The aqueous solutions of certain drugs, and especially of eserine, Terson says, are unstable and often irritating—the oily collyria have been much criticised; but the author offers additional data in their defense. The one per cent. strength oily solution of eserine has most marked advantages. In spite of the large dosage it is well borne and has proved successful in cases of glaucoma, in which the aqueous solutions were both irritating and inefficient. It is permanent and remains aseptic. The oily collyria of atropine give good results and possess the important advantages of permanency and of remaining aseptic. The oily collyria of cocaine, while possessing marked anesthetic properties, cannot replace

the aqueous solution of the same drug because of the inconvenience of employing oil on an eye about to be operated upon.

The author has used oily collyria of other drugs, but their less solubility, he thinks, renders their action far inferior to those which are placed in aqueous solutions.

Procedure for the Cutaneous Incision of the Lacrimal Sac.

TERSON, Paris. (*Annales d'Oculistique*, July, 1902.) After incision of the superior canaliculus Terson introduces a strabismus hook through the canal into the lacrimal sac, and while using its blunt point as a guide, easily gains entrance into the sac. By employing a perforated point, a silver wire may be threaded through the same, and a permanent drainage apparatus established in this manner.

Regarding the Pupillary Disturbances in Patients Who Are Afflicted With Aortic Dilation.

CHAILLOUS, Paris. (*Annales d'Oculistique*, July, 1902.) Chaillous concludes his paper on this subject as follows: The most frequent of the pupillary symptoms which are coincident with aneurism of the arch of the aorta, are due to the same cause which produces the aneurism, namely syphilis. This conclusion, he says, has not only a theoretical value, but at once evidences the importance of a systematic examination of the pupils in all instances, and especially of the irides which are attacked with vascular lesions.

On Acute and Subacute Conjunctivitis in Paraguay.

ELMASSIAU, Paraguay. (*Annales d'Oculistique*, July, 1902.) The author has repeatedly demonstrated the presence of the Weeks bacillus as well as the diplobacillus of Morax in the cases of acute and subacute conjunctivitis that occur in Paraguay—especially at the beginning of the hot seasons.

The Differential Characters of "The Granulations" and of the Inflammations of the Conjunctiva.

DE WECKER, Paris. (*Annales d'Oculistique*, July, 1902.) De Wecker considers the deforming character of the granulations, the evolution of the cicatrix, and the progressive destruction of the conjunctiva, the essential features in the diagnosis of trachoma, and says that these differential points are much preferable to those which are based on

"the absence even of specific organisms"—which he quotes from a recent essay by Morax.

He believes that many of the so-called true granulation cases are the sequels of an acute conjunctivitis following infection by the gonococcus and the Weeks bacillus.

A Case of Unilateral and Transient Left Exophthalmus.

RUTTEN, Liege. (*La Clinique Ophtalmologique*, 10th August, 1902.) Rutten reports the case of a fourteen year old boy who awakened one morning to find the lids of the left eye swollen. Seven days later this condition subsided, revealing the presence of a prominent and almost complete blind left eyeball. Examination failed to show any other abnormality, except Graefe and Stellwag symptoms with a diminution of vision to the ability to see to count fingers at two meters' distance. There was a moderate distension of the retinal veins. Eight days later the symptoms increased, and tachycardia, goiter and enlargement of the preauricular glands developed.

Mercury and iodid of potassium, which had been ordered, were continued, relief being so rapid that vision became normal in three weeks' time.

The rapid onset and the peculiar origin of the disease rendered, the author says, the ordinary local causes of exophthalmus impossible, and forced him to a diagnosis of Graves' disease, which is supported by a history of heredity and by the nervous and anemic conditions of the patient.

Extraordinary Dilation of the Lacrimal Sac of the Left Eye.

RUTTEN, Liege. (*La Clinique Ophtalmologique*, 10th August, 1902.) Rutten details the history of a case of dacriocystitis of thirty years standing. Until two years before being seen there had not been any difficulty experienced in emptying the sac. Twenty-two months later expression of the contents of the sac became impossible and a tumor which rapidly reached the size of a hen's egg, and interfered with the vision of the corresponding eye, formed. Pressure on the mass produced a flow of pus from the nose and the corresponding canaliculus.

Extirpation of the sac was performed, followed by permanent relief. Examination of the sac with the microscope revealed an inner membrane of epithelium composed

superficially of stratified cells and deeply seated rounded cells. Throughout the mass many of the cells were found to be the seat of fatty degeneration. The outer membrane was composed of dense fibrous tissue.

Bacteriological Researches Upon the Etiology of Granular Conjunctivitis.

MORAX, Paris. (*Annales d'Oculistique*, July, 1902.) After a review of the work of Sattler, Müller and others, Morax details his own methods of research and their results. The findings have been largely negative, the only positive deductions in his studies being that the organisms to which the above authors have ascribed an etiological role, are not the cause of the affection.

Optic Neuritis Consecutive to Rubeola.

FAGE, Amiens. (*Annales d'Oculislique*, July, 1902.) After a brief mention of reported cases, Fage details the history of a child three years of age, in whom immediately following an attack of rubeola, marked diminution of vision in association with the ophthalmoscopic appearance of a medium grade type of optic neuritis developed. Treatment was futile, atrophic degeneration and apparently complete blindness following the attack.

Boucher, he says, has reported a case in which marked amblyopia associated with practically no ophthalmoscopic changes developed after the disease, and in which he adopted the theory of a cortical lesion due to circulatory disturbance. He tells us that in a case, which was reported by Calmeil, such alterations in the occipital cortex were demonstrated anatomically. He says that when there are but slight or no ophthalmoscopic changes, the explanation may be that there is an infectious retrobulbar neuritis, the infection taking place from the nose through the cribriform plate and along the optic nerve sheaths. When ophthalmoscopic changes are present, however, he believes that we have to do either with a descending neuritis which is associated with a meningitis or with a condition which is dependent upon the direct action of the toxins on the optic nerves; and this is the explanation which he adopts as to the cause of his case.

A Rare Case of Ocular Hysteria in a Man.

STRZEMINSKI, Wilna. (*Recueil d'Ophtalmologie*, August, 1902.) Strzeminski's case was that of a twenty-three year

old man whose father was an alcoholic, and whose mother was a victim of migraine. An aunt was hysterical and a great uncle was an epileptic. One year before the condition about to be described, the patient had had an attack of aphonia, which lasted several hours' time, and during which he was unable to move either his lips or his tongue. During the past few years his eyes became quickly fatigued and were very sensitive to light. Bright colors were always determined by him as sensations of "red" After an emotional storm the patient suddenly became blind in the right eye and a few minutes later in the left. Examination an hour later failed to show any signs of inflammation. The pupils were slightly dilated. The irides failed to evidence any reflex to light stimulus, though reacting to convergence. The conjunctiva were anesthetic. The right cornea was anesthetic, while the left was partly so. Both eyes were emmetropic and the ophthalmoscopic examination was negative. Vision was nil. Examination of the general system showed complete hemianesthesia of the right side involving both the skin and the mucous membranes. The following day the vision of the left eye returned. The pupil remained slightly dilated, but the iris reacted to light, accommodation, and convergence. Examination of the color field showed a concentric contraction for white and blue; that for red corresponding with that for white.

During the examination of the fields of vision they became reduced to but six to ten degrees, to reenlarge after a period of rest. Stereoscopic examination demonstrated that there was vision in the subjectively blind eye. Three days later the vision of the right eye returned to normal in a period of five minutes time. For a period of several months various repetitions of the above symptoms with the addition of hemianopsia, central scotoma, paralysis of accommodation, nystagmus, and erythropsia, all appeared. The case terminated in complete recovery.

The author states that the occurrence of nystagmus, hemianopsia, paralysis of accommodation and central scotoma, as symptoms of hysteria, have been denied by many prominent writers, but he believes that his case has demonstrated the possibilitity of their occurrence.

On Extirpation of the Lacrimal Sac.

VALUDE, Paris. (*Annales d'Oculistique*, July, 1902.) Extirpation of the lacrimal sac, Valude says, is an old operation, having been first practiced in 1724 by Plather. Berlin, however, in 1868, first generalized the operation which is in general favor in Germany. The advantage of the procedure is the rapid and complete relief which follows its correct performance. The instruments necessary are sharp retractors, a strong bistoury, a small curved sharp curette, curved and straight scissors, and hemostats. The cutaneous incision should begin above the internal palpebral ligament and made to follow the orbital border, so as to end eight or ten millimeters outside of the median line, the sac being thus situated in the outer flap.

Bleeding from the angular artery is considerable, but may be controlled by a hemostat. The incision is carried down to the bone, after which the sac, having previously been packed with some sterile substance, is dissected out from within outward. A small pencil of iodoform is introduced into the orifice of the nasal canal, after which the skin is sutured, and a compress dressing is applied and changed daily for seven to eight day's time, in order to prevent the accumulation of any fluid.

The author prefers general anesthesia for the operation.

The Extraction of Cataract Complicated With Dacriocystitis.

TERSON, Toulouse. (*La Clinique Ophtalmologique*, 10th August, 1902.) In these cases, Terson tells us that Rollet has recently obliterated the sac by its complete removal as a preleminary operation, while Haab has advised previous obliteration of the canaliculi by the galvano-cautery. Terson's plan is to employ protargol injection with abundant irrigation of the sac for some two weeks or more time, until the mucopurulent secretion has ceased. He then performs extraction after careful irrigation and makes use of the usual toilet. The after-dressing which he applies consists of cotton, which is kept constantly moist with a sterile solution of boracic acid. At the end of twenty-four hours' time, this dressing is removed, but unless there are signs of trouble, the lids are not separated. At the end of forty-eight hours daily irrigations of the canal are commenced and continued for varying periods of time. From the fourth to the eighth day the dressing is merely

kept moistened with the boracic acid solution. This method of treatment, he says, includes a period of thirty to forty days; not much longer than that which is required by the Rollet method, and it avoids the inconveniences which follow obliteration of the sac. The author reports a case in which the method as given was successfully employed.

On Extirpation of the Ciliary Ganglion.

ROHMER, Nancy. (*Annales d' Oculistique*, July, 1902.) The operation of choice in simple chronic glaucoma, Rohmer states, is extirpation of the superior cervical ganglion as proposed by Abadie in 1897. This author, he says, likewise predicted that excision of the ophthalmic ganglion would prove beneficial, but believed that the operation was unpracticable on account of its difficulty. Rohmer, after describing the position and appearance of this ganglion, gives the history of five cases of absolute glaucoma in which he performed the operation for its removal. In four of these cases he made a temporary resection of the orbital wall, after the method of Krönlein. In the fifth he simply divided the soft tissues, as in Krönlein's operation. After section and retraction of the osseous flap, the separated periosteum and the orbital aponeurosis were divided from before backward for the distance of about one centimeter. Through this opening the external rectus muscle was divided a short distance from the sclerotic, after passing a thread through its posterior portion to serve as a guide.

With a pair of specially constructed forceps, the region of the optic foramen was explored, the forceps being introduced partly open and then closed; this done, they were withdrawn energetically, but not roughly. The fatty tissue, he says, tears easily. If any resistance is felt, a new purchase should be taken. After five to seven such attempts considerable fat, along with pieces of the ganglion and both its afferent and efferent branches—both of which may escape detection, on account of their being crushed by the forceps—will have been removed.

When the object of the operation has been attained—as determined by a diminution of intraocular tension and a lessening of the congestion—the operation is concluded by suturing the external rectus muscle into position, the introduction of a small rubber drain deep into the orbit, re-

placement of the orbit flap, suturing of the skin, and the application of a sterile compress dressing. During the first forty-eight hours' time there is usually considerable oozing. At the end of this period the first dressing is made, the drain generally removed and a compress dressing applied. The cutaneous wound is ordinarily closed in about eight days' time. Considerable ecchymosis and edema may accompany convalescence, but need not cause any anxiety. Clinically, the results have been gratifying: relief of pain and diminution of the tension following within forty-eight hours' time. Should the symptoms reappear, they will never exhibit their former virulence. Often, after operation, there is considerable interference with the ocular movement, this being due either to the lesion of the external rectus muscle or to an ankylosis, which is consecutive to post-operative tumor-hemorrhage. The operation is preferable to optic-ciliary neurectomy, since it far less affects ocular nutrition. So far, the author has only adopted the operation in cases of absolute glaucoma. With an improved technique, he believes that the procedure will be applicable to cases of both acute and subacute glaucoma.

Adrenalin, the Active Principle of Suprarenal Capsule.

KIRCHNER, Bamburg. (*La Clinique Ophtalmologique*, 10th August, 1902.) Kirchner makes note of the very general use of the extract of suprarenal capsule and, also, upon its instability. The hydrochlorat salt, however, he states, forms a permanent and powerful solution, which may be used in strengths of from one to one thousand to one to ten thousand. This solution may be used alone or in combinaton. The author reports a case of chronic conjunctival catarrh in which instillations of the drug led to rapid recovery after the complete intolerance and failure of other therapeutic agents. In the second case, one of subacute glaucoma in which there had not been any response to treatment (the conjunctiva being markedly congested and granular, the pain continuous and the pupils dilated), a solution of adrenalin in combination with pilocarpine and eserine was employed. Relief was rapid and one eye recovered and retained almost normal vision under a course of treatment lasting a period of several months' time. The author has never seen consecutive

hyperemia follow the use of adrenalin, and believes that, besides its importance in the treatment of glaucoma, it is of use, when it is combined with cocain, in operations or in inflamed eyes.

Sarcoma of the Left Orbit and Globe: Operation: Cure.

RUTTEN, Liege. (*La Clinique Ophtalmologique*, 10th and 25th September, 1902.) Rutten reports the case of a fifty-seven-year-old man who received a blow on the left orbital region in 1889, which was followed by loss of vision and phthisis bulbi of the same side. In 1900 a second blow was received in the same region, this being succeeded by the development of an exophthalmus and an excrescence on the outer side of the eyeball. The development of headache, nausea and vomiting, with general weakness and symptoms of sympathetic irritation, brought the patient to the author, who noticed a hazelnut-sized tumor situated on the outer surface of a moderately proptosed globe, which possessed some disturbance of motility and an increase of tension.

Careful examination showed that there was not any involvement of the ganglia or of the adjacent cavities and sinuses.

Enucleation of the eyeball, with evisceration of the orbital cavity, was performed.

At the present time, ten months later, there has not been any return of the condition. The tumor was forty-eight by twenty-seven by thirty millimeters in size and was partly ocular and partly orbital. Examination with the microscope showed it to be composed of a spindle-celled sarcoma of the alveolar type, and that it arose from the chorioid.

Measure of the Visual Acuity.

BOUCHART. (*Recueil d'Ophtalmologie*, September, 1902.) Bouchart presents two new styles of test for the determination of visual acuity, the first consisting of squares of varying sizes, made of alternating bars of black and white. The width of the white and black bars are the same in each square, varying proportionately to the size of the squares, each of which contains one more of the white than of the black.

The squares with the bars arranged vertically or horizontally are placed on a double roller which is similar to

that of a camera film. By this arrangement they can be rotated before an opening in a screen.

The second design consists of plates which contain variously sized figures of round, square, lozenge, and elliptical shape. Some of the squares are placed at angles of forty-five degrees, while the lozenges and elliptical figures are arranged with their axes placed both horizontally and vertically.

The author says that confusion of these various shapes is very easy, and their detection is more difficult than the mere reading of the corresponding sizes of Snellen types.

Facial Paralysis and Associated Paralysis of the Lateral Movements of the Ocular Globes to the Same Side.

PECHIN and ALLARD, Paris. (*Recueil d'Ophtalmologie*, September, 1902.) Pechin and Allard report a case in which, with the presence of pronounced stigmata of hysteria, there were associated a complete paralysis of the left facial nerve and an inability to rotate the eyes to the left. The vision and the eyegrounds were normal. The electrical reactions were exaggerated but retained their normal formula.

As to the cause of the palsies, the authors believe that hysteria can be excluded because of the absolute and unchanging character of the facial involvement and the exaggeration of the electrical reaction which is not present in hysteria. A peripheral or a nuclear lesion of the facial nerve, they say, is excluded by the absence of the signs of degeneration. A central lesion would not exist with the absence of homiplegia and the presence of complete facial palsy; these same symptoms excluding also any cortical lesion. The ocular symptoms, they believe, are not due to a nuclear involvement since in this disease, disassociated paralyses are the rule. The lesion must, they think, be situated in one of the coördinating centers, and therefore located supranuclearly or extranuclearly. In conclusion, the authors adopt a lesion of the quadrigeminate bodies or of one in their vicinity as the causative element for the paralysis seen in the case.

The Operation for Morgagnian Cataract.

BOURGEOIS, Reims. (*Recueil d'Ophtalmologie*, September, 1902.) Morgagnian cataract, Bourgeois says, occurs once in two hundred and fifty of the ordinary type. The

important part of any operation for this form of cataract consists in the capsulotomy. This portion of the procedure should be performed at the upper periphery and the opening must be made of sufficient size to allow expulsion of the nucleus of the lens. In quiet cases the author employs simple extraction. In restless ones, he makes use of an inferior corneal section with a small iridectomy. The difficult part of the operation, he believes, rests in the risk of making too small a capsulotomy, which, owing to a rapid collapse of the membrane after its puncture, is almost impossible to enlarge. The diagnosis of Morgagnian cataract, he states, depends upon the detection of the movable amber colored nucleus lying in the most inferior part of the capsular sac.

With the exception given above, the author does not believe in combined extraction for this form of cataract because of the friability of the capsule and the dangers of a sudden expulsion of the lens.

On the Electric Ophthalmias.

GALEZOWSKI, Paris. (*Recueil d' Ophtalmologie*, September, 1902.) Electric traumata to the eyes may be of two kinds, Galezowski says: first, burns, similar to those which are produced by other agents; and second, injurious effects upon the retina. He reports a case in which both conditions were present. The retinal symptoms with absence of any visible lesion of this membrane, were photophobia and central scotoma—both of which shortly disappeared.

The author also reports a case of simulated blindness following exposure to an electric discharge. He advises the use of fine spray douches of a solution of bromid of sodium and dionin applied to the open eye four or five minutes at a time three times a day. This treatment may be usefully employed as well in cases of the conjunctival form of irritation as in those of the retinal type.

Glaucoma Following Acute Iritis.

STRZEMINSKI, Wilna. (*Recueil d' Ophtalmologie*, September, 1902.) Strzeminski reports a case of glaucoma following an attack of acute rheumatic iridocyclitis, associated with the formation of posterior synechiæ. The glaucomatic condition was demonstrated by increased tension, increase of the pericorneal injection, and disturbance

of corneal surface and sensibility. Under the use of eserine and pilocarpine, the ocular conditions returned practically to normal.

The author believes that his cases were the results of an obstruction in the lymphatic passages by fibrinous exudates.

Hydrophthalmus and Cardiovascular Disturbances.

De Lapersonne, Paris. (*Archives d'Ophtalmologie*, September, 1902.) De Lapersonne believes that in the study of the pathogenesis of hydrophthalmus not enough attention has been given to the vascular theory which has been particularly sustained by Angelucci and Gallenga. These writers, he says, assume the presence of congenital disturbances of the circulatory equilibrium of the interior of the eye. The vasomotor ataxia of Cohen, whatever may be its cause, he says, results in a vasodilatation with a hypersecretion which will explain all the symptoms of an hydropthalmus. Angelucci, he informs us, has observed cases of this affection which were associated with vascular disturbances of Basedowian type. The author reports a similar instance in a female of twenty-two years of age, who in addition to the hydrophthalmus, had tachycardia, increased arterial tension, and nervous irritability. After repeated attacks of pain in one eye an anterior sclerotomy was done with but temporary relief. Later, double excision of the cervical sympathetic was performed —this being followed by a permanent reduction of the ocular tension to normal, moderate contraction of the pupil, and relief of ocular pain. The tachycardia and arterial tension were also practically reduced to normal. From implication of the sensory nerves to the region of the shoulder, he says, moderate pain in that position followed the operation and has persisted.

The Couching of Cataract.

Bourgeois, Reims. (*Recueil d'Ophtalmologie*, September, 1902.) Bourgeois has twice performed couching in which the eye was lost a month later by glaucoma. Within the past year he has three times performed the operation after a peripheral iridectomy done fifteen days previous—and in each he had good and permanent results. The operation, he states, is indicated where there is fear of hemorrhage, infection, indocility, liquid vitre-

ous, etc. To perform it, the patient being placed in a sitting position in a dark room, the needle is introduced in the horizontal meridian five millimeters behind the limbus of the cornea. The point of the instrument is carried to the pupillary space and is then depressed by raising the handle forward and upward, holding it in this position for a time. Aseptic dressing is applied, and the patient is kept out of bed.

Palpebral and Conjunctival Manifestations Supervening During the Course of Intraocular Affections.

PETIT, Rouen. (*Annales d'Oculistique*, September, 1902.) Petit reports the case of a syphilitic who had acquired the disease some fifteen years before. For ten years past he had suffered from fulgerent pains in the limbs with a sense of constriction around the waist. His condition had been diagnosed as tabes dorsalis. Two days after an attack of hemiparesis with hemianopsia on the right side, he developed pronounced pain in the right orbit, together with marked edema of the lids, chemosis, and photophobia. There were not any changes in the fundus of the eyes, and vision was normal. Under vigorous specifie treatment and the use of dionin instillations and hot compresses locally, the inflammatory ocular symptoms disappeared. An identical attack followed on the left side. Two months later the patient had recovered from the attack except for the presence of the hemianopsia.

The author believes the hemianopic symptoms to have been the result of a syphilitic involvement of the occipital cortex in the region of the cuneus, while the hemiplegia was due to internal capsule involvement. To explain the inflammatory symptoms in the distribution of the trifacial nerve, he says, is difficult. Possibly it may have been a syphilitic arteritis involving the bulbar root of the nerve or the Gasserian ganglion. The hypothesis of a vascular spasm, he believes, might explain these cases, but it could not be applied to the complex type he has reported.

Influence of Total Correction on the Progression of Myopia.

VACHER and BAILLIART, Orleans. (*Annales d'Oculistique*, September, 1902.) The majority of ophthalmologists, Vacher and Bailliart state, prescribe partial correction of myopia in the belief that the accommodation exercises an injurious effect in this condition and is the prin-

cipal factor in its progression. In support of full correction, the authors believe that marked effort in accommodation in myopic eyes is due to atrophy of the circular fibres which may be dangerous as a result of the overaction of the longitudinal fibres. In their methods of correction of myopia, the authors make the following classes: First, deep membranes intact, small staphyloma, normal vision with total correction. In this type total correction is given for near and for distance. If difficulty is experienced during near work the total error is to be gradually corrected in a few months' time; second, progressive staphyloma, reduced vision after total correction. In this type total correction would be dangerous. Complete rest should be obtained by the use of atropin, the covering of one eye to avoid convergence, and the avoidance of strong light. Gradually increasing strengths of correction in order to allow of development of normal muscular action should be adopted.

Operative Intervention in Secondary Cataract.

PANAS, Paris. (*Archives d'Ophtalmologie*, September, 1902.) The ideal operation for cataract, Panas says, would be the simultaneous extraction of the lens and its capsule. This method, however, is very little practiced on account of its dangers. Extraction of cataract is frequently followed therefore by a more or less marked interference with vision due to the development of opacification of the remaining lens capsule. Soft or immature cataracts more often than others are followed by secondary cataract, dependent upon the adherence of the transparent cortex to the capsule In cases of capsulo-lenticular cataract the anterior capsule is already opaque and should be removed at the time of the extraction, this being easily done by reason of the membrane being tough. The posterior capsule, however, usually remains transparent, the author having seen but one case of so called tertiary cataract follow the operations as given above. Contrary to de Wecker and others, he believes that secondary cataract is more frequent after the combined operation, this being dependent upon, he says, to the traumatism to the iris. The greater ease of extraction of the cortical masses, the retention of which often produces secondary cataract, he asserts is favorable to the combined methods only in

cases of cataracts of pitch-like consistence, in immature cataracts in young people, in cases which are complicated by synechiæ or a rigid pupil, and in cases of tremulous and subluxated lenses. Recent opinion, he thinks, favors the discission of delicate secondary cataracts, the use of a knife or a scissors on those of moderate density, and the employment of an iridocapsulotomy for those cases in which the tissues are thick and extensively adherent.

The author enumerates the various difficulties of discission, the difficulty of execution, the frequent subsequent complications, and the frequency of failure as to optical results. After an historical review of the extraction of secondary cataract as practiced by Mackenzie, Desmarres and others, the author describes his operation, as performed on ninety recent cases. With an ordinary keratome, an incision eight to ten millimeters long is made in the corneal margin, care being taken to avoid emptying the anterior chamber. With a pair of articulated forceps, the membrane is seized and by delicate traction in various directions, is released from its attachments to the zonule and from any points of adhesion to the iris. In association with the lens capsule and any contained cortical debris, it is then removed in its entirety. If the membrane is too delicate to be so removed, and only a central opening is obtained, a small capsuloiridectomy is to be made. If the membrane is too strongly adherent to the iris, a double capsuloiridectomy, so placed as to obtain a properly placed pupil, is done. In controversion to the objection that the traction on the ciliary processes exerted by the operation is dangerous, the author has not observed any bad results, this being due, he believes, to the fact that the rupture of the zonular fibres occurs at their insertion into the capsule, and not at their base at the ciliary processes. In but one case out of the ninety studied did an intractable glaucoma result In one instance detachment of the retina, as the sequel of an accident, followed in five months' time.

On the Total Correction of Myopia.

CHEVALLEREAU, Paris. (*Annales d'Oculistique*, September, 1902.) Some writers, Chevallereau states, believe that the accommodation is the principal cause for the progression of myopia; these, therefore, prescribe the atropine

treatment, use the weakest possible concave lenses or, as with Javal, even employ a convex lens, if this is necessary to place the far point at twenty-five centimeters. The author sees only one reason why myopes should accommodate: that is in the presence of astigmatism or of partial spasm of the ciliary muscle, the latter, to him, being of questionable occurrence. On the contrary, the absence of accommodation is proven by the dilated pupil, a tendency to divergence and the demonstration of atrophy of the circular fibres of the ciliary muscle. Moreover, Girard-Teulon has demonstrated that it is rather the act of convergence which provokes the myopia, which renders it progressive and which produces its complications. To obviate convergence for reading and writing at thirty-three centimeters, as well as for all the conditions of visual use, it is, therefore, necessary, he says, to give full correction of the myopia and of the astigmatism. Even if an over-correction is given, no harm will follow, for no true fundus lesions are produced by "hypermetropia." The author cites two cases, in one of which a man with emmetropic eyes had mistakenly worn concave spherical lenses of six diopters' strength for a period of twenty-two years without any bad result, proving that a spasm of accommodation lasting even such period of time is not productive of myopic changes. The only argument found by the author which might lead him to support the accommodation theory is that advanced by Hensen and Walker—that the horizontal fibres of the tensor of the chorioid so contract as to advance that membrane. As this action, however, cannot pass to the macula, the atrophic crescent should, therefore, be situated on the nasal, rather than on the outer side of the optic disc. He further says that Donders and Girard-Teulon have noted that a total correction of low and moderate degrees of nearsightedness has permanently arrested the progress of the condition.

In conclusion, he says that in young subjects a total and permanent correction is indispensable for the prevention of the progress of myopia and the avoidance of any complications.

Hemorrhage During the Course of Iritis.

FAGE, Amiens. (*La Clinique Ophtalmologique*, 10th and 25th September, 1902.) Hyphema during the course of

iritis, may be due, Fage asserts, to atheroma, vasomotor, dilation, alteration of the blood, to hemophilia, or to hyperglobuli, as in the following case reported by the author: The patient, a man of forty-six years of age, had been suffering from an attack of rheumatic iritis for twelve days' time, when a hyphemia, together with an augmentation of the pain and other ocular symptoms, developed. The occurrence of the blood, the author believes, is without prognostic significance. He believes that during the time of the presence of the blood in the anterior chamber the use of atropine should be suspended; leeching and rest, with the internal administration of hydrobromat of quinine, being most useful. Paracentesis of the cornea should not be done, except for the relief of intense pain or for marked increase of intraocular tension, because any rapid lowering of intraocular tension might give rise to increased hemorrhage.

ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC LITERATURE

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(Quarter ending September 30, 1902.)

Primary Sarcoma of the Iris.

WOOD, CASEY A., & PUSEY, BROWN, Chicago. (*Archives of Ophth.*, July, 1902.) The writers begin their very instructive paper with a brief historical review of the published records of Primary Sarcoma of the Iris, in which microscopical examinations have been made, the first cases having been those of Hirschberg and Lebrun, published in 1868, and the last those cases reported in 1898.

With a view to accuracy and hence increased value, the article includes consideration of those cases only in which an histological examination of the tissues was made and the clinical diagnosis thus confirmed. This excludes from this list some cases which are not included in the lists of other authors. Original articles or original communications are used.

Before discussing the subject of primary sarcoma of the iris in general, the writers give complete reports, with illustrations, of their own case and the cases of Drs. Coleman, Hotz, Denig, Friedenwald and Komoto. Abstracts are given from original publications of 80 recorded cases, with bibliography, including some that were overlooked in former bibliographies; also abstracts of 16 cases from private and hitherto unpublished records furnished the

authors for this paper. Wood & Pusey collected 23 unrecorded histories, which they were able to add to the 64 cases previously published. These abstracts give (1) the author, (2) age and sex, (3) history, (4) condition when first seen, (5) condition at time of operation, (6) tension, (7) vision, (8) primary position of tumor, (9) operation, (10) microscopical examination of iris and globe if enucleated, and (11) remarks on treatment and later history of the case.

Using this very complete collection of previously published and hitherto unpublished material as a basis, the writers enter into a discussion of the anatomy, occurrence, etiology, course, differential diagnosis, prognosis and treatment of primary sarcoma of the iris, and furnish many valuable data and conclusions.

The expressions "diffuse sarcoma" or "circumscribed sarcoma" used in descriptions of sarcoma of the eye are really only relative terms since an absolutely circumscribed sarcoma of the eye is certainly a great rarity; sarcoma of the iris is a diffuse growth. Microscopically, it consists of small round and small spindle cells; the rate of growth is slow, as is evidenced by the tendency to alveolation; it has the appearance usually described as fibro-sarcoma; the tissues show no evidences of degenerative changes and very little inflammatory reaction. The cells are usually said to originate from mesoblastic tissue; 11 cases have grown from congenital nevi; 3 of the specimens studied showed an arrangement of the cells around the bloodvessels which greatly resembles those described under the term peri-endothelioma; the bloodvessels and blood spaces did not differ from those of ordinary sarcoma. Sarcoma of the iris is usually pigmented, the character and distribution of the pigment not differing from that found in other melanotic sarcomata, the origin, chemical composition and properties of which is still a matter of contention.

Regarding the relative frequency, 83 cases are recorded with histologic examination and five or six reported where the diagnosis could hardly be questioned, in all about 90 cases; it is, therefore, one of the rarest of eye diseases; the iris is as often the seat of sarcoma as the chorioid.

As to age, 27 cases occurred under and 57 after

thirty years of age; 36 cases were in females and 45 in males. In 33 cases the right eye was affected and in 28 the left. The lower half of the iris was the primary site of the growth in 33 cases; the upper half in 13; nasal side in 5, and temporal side in 2 cases.

The course and symptoms usually resolve themselves into four stages, in accordance with Knapp's classic description. The first stage is marked by growing tumor, usually pigmented; the second stage presents the symptoms of any intra-ocular tumor: increase of tension, loss of vision, hazy cornea, presence of a tumor and pain. The third and fourth stages are due to perforation of the wall of the globe and metastasis.

Concerning differential diagnosis, the writers give the following points:

"In the first stage of its development, a small pigmented sarcoma of the iris may easily be confounded with a *simple melanoma*. The point of greatest importance in the differential diagnosis between these tumors is the fact that a simple melanoma is stationary, while a sarcoma is a progressive growth. If the question should arise as to whether a suspected tumor is increasing in size, and is, therefore, sarcomatous, it would be proper to wait awhile. A month or two would probably be long enough to settle this point. If the diagnosis cannot be made clinically by waiting, it certainly could be made promptly by examining the suspected growth histologically; it would be proper in a suspicious case to remove a portion of the tumor by iridectomy. Simple melanomas are congenital. This also is a point of great importance, but one must remember that the patient's evidence in such a matter is frequently very uncertain. A point of some importance is that a melanoma is usually more pigmented and, therefore, darker in color than a sarcoma. It is to be remembered also, that simple melanomas do not, as a rule, project above the plane of the iris. In the second stage of its development there can be little trouble in differentiating between sarcoma and melanoma; a melanoma does not cause inflammatory symptoms or glaucoma. Of course, a patient with melanoma might exhibit inflammatory symptoms, due, for example, to syphilis; but such a case could probably be promptly decided by the history and the other symptoms.

The same might be said of a possible combination of melanoma in an eye with inflammatory glaucoma due to other causes. If the question could not be otherwise settled, it would be proper to excise the suspected growth by iridectomy, and examine it histologically; in the case of acute inflammatory glaucoma with suspected melanoma the iridectomy would be the more indicated for evident reasons.

The differential diagnosis from *gumma* and *tubercle*, in the first stage of the development of sarcoma of the iris, should offer no difficulty; a tubercle or gumma could not long exist in the iris without causing inflammatory reaction. Here the history will be of great importance. At the first onset of gumma or tubercle there are inflammatory symptoms, while sarcoma may grow for weeks or months with no inflammatory reaction. In many cases sarcomas have developed from pigment spots which have been observed for years; the history may bring out such fact. If the patient has had syphilis, the therapeutic test by the administration of mercury and the iodides on the growth may be resorted to. The existence of tuberculosis in other portions of the body should be determined. The age of the patient would be of some importance in differentiating between a localized tubercle and a sarcoma, and should be considered. Most sarcomas occur late in life, while tuberculosis is rather an affection of adolescence. A suspicious circumstance would be a history of previous attacks of obscuration of vision; these would indicate sarcoma, for in a number of these cases there are histories of recurrent hemorrhages into the anterior chamber, and also glaucomatous attacks.

The appearance of the iris throws much light on the subject. In sarcoma the iris is usually swollen, muddy, and inactive to light and mydriatics only in the region of the growth; in tubercle and gumma, on the other hand, there are symptoms of severe and diffuse iritis, with haziness of the aqueous and probably hypopyon. It is a fact that hypopyon is not mentioned as present in a single case of iris sarcoma. In many instances of the latter there have been multiple points of growth visible. This fact must be remembered, and it is spoken of here particulary, because different authors have made the statement, that multiple

tumors indicate tuberculosis, and have said that such a condition is of great value in differential diagnosis.

Most sarcomas of the iris are pigmented; hence the dark appearance of a suspected growth points to sarcoma, but it must be remembered that some sarcomas are non-pigmented, and even some pigmented sarcomas have appeared to be "white" clinically. On the other hand, a small gumma situated in a dark iris with its engorged vessels may seem quite dark in color. The value of the appearance of the growth in diagnosis may be destroyed when the tumor is seen through a hazy cornea.

The degree of inflammation is of much importance; gumma and tubercle cause the greater reaction.

A statement said to be of differential diagnostic value between tubercle and sarcoma is that the latter seldom or never perforates at the limbus. Yet in one case perforation did occur at the limbus.

If, after a consideration of the clinical points just enumerated, and especially if the tumor does not disappear under anti-syphilitic treatment, the diagnosis is still unsatisfactory, we would advise the removal of the growth and its examination histologically."

The etiology is next discussed, the subject just now engaging the attention of pathologists the world over. The attention of the writers was, however, attracted by the fact that many of these tumors seem to have developed from congenital pigment nevi; there was a clear history of the existence of pigmented lesions since early youth, from which subsequent sarcomas developed in at least 12 per cent. of the cases.

"It probably is a fact that pigmented nevus of the iris is in every way similar to the same tumor in the skin; it certainly is a fact that, clinically, a pigmented nevus of the iris should be regarded by the ophthalmic surgeon with as much suspicion as a pigmented mole in the skin is observed by the general surgeon, and there is no better place in this paper than this to say that such a growth in an eye, associated with inflammatory or glaucomatous symptoms, should arouse suspicion and be dealt with accordingly."

"In contrast to the fact that sarcomas of the chorioid have been known to develop in atrophic globes—indeed,

seem to have a predilection for such eyes, it is interesting to notice that there is no recorded case of sarcoma developing in the iris of such an eyeball."

There were but an insignificant number of cases in which there was a history of preexisting inflammation caused by traumatism.

The prognosis as regards life of the patient is the same as in all sarcomas; safety depends upon the early and complete removal of the growth; the question of retaining an eye afflicted with sarcoma of the iris is discussed under the paragraph in treatment.

Finally the question of treatment is taken up—the main *raison d'etre* of the present article.

"There has never been any difference of opinion as to what should be done when such a growth is met with. Nobody has denied the proposition that a sarcoma of the iris should be removed as soon as the diagnosis is established; but what constitutes *effective* removal has given rise to great differences of opinion."

The writers give extracts from a number of monographs and articles upon this subject in order to give an idea of the varied advice to be found on the subject of treatment of these growths.

"Fuchs's advice has been widely quoted and has probably been the cause of misunderstanding, and possibly harm, inasmuch as his dictum has been construed as favoring removal by iridectomy, although he distinctly says that iridectomy is only to be done when the tumor can be *entirely* removed by such an operation. His statement on the subject can only be interpreted as meaning that, at times, sarcoma can be recognized as localized in the iris, and then it can be removed by iridectomy.

The question before us is: Can we determine clinically that a particular growth is limited to the iris? We are assisted in coming to a conclusion by a consideration of the cases that have been observed.

It is hardly necessary to state the fact that this is an important subject. On the one hand, there is the chance of preserving the eye—removal by iridectomy; on the other, the possibility of endangering the life of the individual by failure to remove the whole tumor. In some of these cases the surgeon's responsibility is lightened by the

fact that the growth has already seriously impaired the eye as a visual organ; every one will grant that in such a case the question of treatment is simple."

The writers present a classification of the cases into (1) cases in which enucleation was done, with histological findings, and (2) cases in which iridectomy was done with after-history and histological findings.

Enucleation was done in 57 cases, eliminating 16 cases which must be excluded from consideration for various reasons, there remain "*41 cases in which the histological examination of the enucleated globe showed involvement of other parts than the iris.*"

Iridectomy was done in 27 cases; in three cases the results were bad; in 18 cases the notes form interesting reading—in some of them the continued growth of the tumor was only too evident; in estimating the results it is necessary to remember that the growth of these tumors is usually exceedingly slow, warning one not to be too certain of a cure until a long time—more than three years—has elapsed after the removal. In five cases observed for more than three years, there were no recurrences. In one case in which there was apparently no return, the eyeball was enucleated 11 years after the irideciomy; it showed inflammation of the ciliary body and remainder of iris with tumor cells; 16 years after the iridectomy, the patient died from general sarcoma.

Metastatic Carcinoma of One Optic Nerve With Peculiar Degeneration of Both Nerves.

HOLDEN, WARD A., New York (*Archives of Ophth.*, Sept., 1902, Vol. XXXI, No. 5), reports case of an optic nerve being destroyed for some distance by a new growth with complete blindness of four months duration without pallor of disc, and the fellow nerve with only an affection of the vessels in the pial sheath causing a limited sclerosis which gave a defect in the visual field. The microscopical findings of each nerve are given in detail and the article is well illustrated.

The author in commenting mentions: "The fact that after blocking of the central artery of the retina, with degeneration of the ganglion cells and later of the nerve fibres, and in cases of permanent blindness after lesions of the nerve in the orbit, in the optic foramen, or within

the cranium, the fibres of the optic nerve degenerate sufficiently to cause pallor of the disc, as a rule, not later than from three to six weeks. The present case proves, however, that with the nerve almost totally destroyed over a considerable longitudinal area total blindness may exist for four months without the disc becoming pale, or any but the slightest microscopic changes being found in the nerve near the ball.

The cause of the blindness in the left eye was apparent at the autopsy, but the cause of the defect in the inferonasal portion of the field of the right eye was puzzling; hence the right nerve was examined with care and serial sections were made of several segments of it. Happily some of these sections were found to contain what was evidently the primary lesion, permitting a rational explanation of the clinical symptoms.

"The present view in regard to the optic nerve is that sclerosis usually means a primary breaking down of the nerve fibres from any cause, followed by a compensatory hyperplasia of neurolgia. Later the nutrient vessels, after the loss of the tissues which it was their chief function to nourish, become degenerated. Thus the blood supply of the connective-tissue septa becomes diminished and in consequence the septa first grow thicker and later shrink.

"On the other hand, we know that, as in other organs, changes in nutrient vessels here also may bring about both the parenchymatous degeneration and the interstitial sclerosis. In this way the condition of this right optic nerve is to be explained. With the general carcinomatous metastases, some vessels running to the pial sheath of the nerve had doubtless been interfered with, and the disturbance of circulation caused a slight degeneration of the nerve fibres and a marked increase in connective tissue and neuroglia.

"As regards the effect of vascular disease on vision, we know that hardened vessels of the circle of Willis about the chiasm and hardened ophthalmic arteries, which run beneath the optic nerves, may cause atrophy by pressure; but it would seem that we must now go further and recognize that disturbances in the pial vessels may by affecting the nutrition of the optic nerve lead to sclerosis of the

nerve and defects in the field of vision. And in this way some of the obscure atrophies of the optic nerve may find an explanation."

A Case of Complete Absence of the Visual System in an Adult.

SPILLER, W. G., Philadelphia. (*Brain*, 1902, page 631, reviewed by A. A. Hubbel in the Ophthalmic Record, June, 1902.) Von Monakow, Spiller says, locates the primary optic centers in the external geniculate body, the surface of the pulvinar and the superficial gray matter of the anterior colliculi of the corpora quadrigemina. Von Monakow says that Stilling, Bernheimer and Kolliver believed that the visual fibres arise also in the subthalamic body, the internal geniculate body, and the tuber cinereum. The anterior colliculi of the corpora quadrigemina in man, according to his view, have a very subordinate role in vision, and he believes that about 80 per cent. of the optic nerve-fibres terminate in the external geniculate body. Spiller's case of congenital absence of the central visual system confirms these views of Von Monakow. It shows also that Meynert's commissure and the habenula are not part of the visual system.

Dr. Spiller's case was that of an absolutely helpless idiot, regarded as a case of cerebral spastic paraplegia of the lower limbs with absence of eyeballs. The body was that of a child of 12 years of age though in reality 22 years; palpebral fissure of each eye very small; orbits containing only a small amount of fibrous connective tissue. The optic foramina did not exist, and it was impossible to find an opening in the usual situation of these foramina, and here there were merely slight depressions in the skull. No trace of optic nerves, chiasm, or optic tracts could be found. There was no sign of an external geniculate body on either side, and the thalamus on each side had nothing resembling an optic tract passing from it. The posterior part of each thalamus was rounded and larger perhaps than one would expect to find it in a case of complete agenesia of the visual system.

Schiller's conclusions from the microscopical examination of the brain are:

(1.) The chief "primary" optic centre is the external geniculate body.

(2.) The pulvinar of the optic thalamus is also an important "primary" optic centre.

(3.) The anterior colliculus of the quadrigeminal body in man has an unimportant relation to vision.

(4.) The subthalmic body, the habenula, the internal geniculate body, probably are not part of the visual system.

(5.) The cortex of the calcarine fissure may contain nearly the normal number of cell bodies, even though the visual system may be undeveloped.

(6.) The nerves to the ocular muscles and their nuclei may be developed even though the visual system is absent.

(7.) Congenital spastic paraplegia may be the result of deficient formation as regards number or size of the neurones of the central motor system, even though such a deficiency may be difficult to detect by the microscope.

The Purely Anatomical Proof of the Existence of Uncrossed Optic Nerve Fibres in Man.

BERNHEIMER, PROF., Innsbruck. (*Archives of Ophth.*, Sept., 1902.) The author published the results of his examination in 1889, in which he was able to show that the uncrossed fibers run chiefly in the upper half of the chiasm. In the tract and in part of the chiasm they are mingled with the crossed optic nerve fibers, and only beyond the chiasm do the two varieties separate, so that the crossed and uncrossed fibers run side by side to the eyeball. In that paper the partial crossing of the optic nerve was proved by a new method—the study of the development of the medullary substance fetus. The proof was obtained only when the uncrossed fibers which had not become fully medullated were examined in continuous serial sections.

Kölliker said: "I place the greatest importance upon the anatomical proof and believe, though not with absolute certainty, that the centripetal fibers arising from the retinas cross completely in man, the dog, the cat and rabbit. * * * And he that claims that there exists a considerable uncrossed bundle must demonstrate it anatomically, for no physiological hypothesis and no experiment will be conclusive."

The author was able to demonstrate this anatomically

from the eyes and brain of a child with bilateral microphthalmos, in which the medullary formation at many points was less advanced than usual at that age and also irregular; the medullation in the paired nerves was also unequal on the two sides.

"In twenty sections through the upper half of the chiasm the interesting fact was noticed that in the right half of the chiasm very few medullated fibers were to be seen, and in many sections none at all. The direction of the sections tended to the right and downward posteriorly.

"In the left half of the chiasm, as seen in these twenty dorsal sections, on the contrary, completely isolated bundles of fibers can be seen, which are composed of individual fibers and can be followed for long distances. These bundles, with their delicate fibers running almost parallel, passing deep downward and inward from the left tract, and through the chiasm parallel to its lateral margin, far into the optic nerve. In the tract, single fibers of the most lateral of these bundles could be followed backward almost to the point where the tract meets the peduncle, and forward in the nerve of the same side almost to the optic foramen. Here, in consequence of peculiar, irregular and non-uniform development of medullary substance and of a slight obliquity of section, we find a considerable number of isolated, fully-medullated bundles of fibers which may be followed uninterruptedly in one and the same section, as bundles and individual fibers, from the left tract to the optic nerve of the same side.

"This is the first purely anatomical proof of the existence of uncrossed fibers, and with this the question is ultimately settled, in the strictest anatomical sense, in favor of semi-decussation."

The article is illustrated with a plate, showing the continuation of the uncrossed fibers from the left tract into the left optic nerve.

Studies in the Retina.

BERNARD, HENRY M., London. (*The Quarterly Journal of Microscopical Science*, Vol. 43, 1900, p. 23; Vol. 44, 1901, p. 443, and Vol. 46, 1902, p. 25. Reviewed by E. E. Blaauw.) Summary. The retina can no longer be regarded as built up of so many separate "cells," each with some definite and permanent morphological value. This view has re-

cently, to all appearance, been strongly confirmed by means of the metal impregnation method.

The results here published, obtained solely by comparisons not only of different eyes, but of the same eye at different ages, involve a direct contradiction to this interpretation of the phenomena. If there ever were distinct cells composing the retina, their walls were early lost. The functional retina is a continuous protoplasmic reticulum in which nuclei are suspended, and the nuclei are not stationary. (1) A large proportion of those which are present in the young retina move outward when it begins to function to begin become the nuclei of the new rods required by growth. (2) Their places are supplied by others migrating inward from the rim. (3) The outward movement continues as long as life lasts, for in old eyes the nuclei of both the innermost and the middle nuclear layers are found to have largely disappeared. Whether 3 is for the supply of new rods or for some regenerative process, we have no means of deciding. These migrations, and especially this using up of the nuclei, in a retina which is all the while functioning normally, shows clearly that some other value must be assigned to its structural elements than that which is needed by the neuron theory as applied to this ogan. It is clear that these nuclei are not the nuclei of cells taking part in fixed morphological chains, every link of which is essential. The nearest approach we obtain to anything like a permanent cell in the retina is the rod with its nucleus; that it would be inaccurate to persist in using the term "visual cell" in this connection will be conclusively shown in the next paper.

According to the usual description, the rods are of the nature of cuticular formations. This is a very natural summing up of the facts: (1) that they are almost certainly the end organs of the nerves, and (2) that their tips are filled with refractive matter of the nature of keratin. This comparison with cuticular cells, although justifiable, is not very close. As prosoplasmic vesicles thrust out against the pigment cells, they absorb the pigment granules and (unless the quantity absorbed be too great and its color too intense) clarify them; somewhat as the stratum lucidum of the epidermis receives and clarifies the pigment brought to it through the skin. Here, however,

the comparison ceases; for, while the cells of the cuticle perish with the waste matter they receive and ultimately fall away as horn-cells, the rods get rid of their refractive contents, which stream away through the retina.

What are called the "cones" of the vertebrate eye, to which special functions distinct from those of the rods have been assigned, are not always analogous structures.

In the amphibia they are the early stages in the formation of new rods, and their form-phases are due to the squeezing between the already existing rods.

In fish analogous stages appear in very young eyes, but in older eyes the inner limbs of the earlier formed rods swell to such enormous sizes that the conditions of the rod layer are altered, and the protrusion of new vesicles can no longer result in the formation of the same cone stages. The rods with the swollen inner limbs have been regarded as "giant cones," although presenting no analogy whatever with the cones in the frog.

In the primates what are usually called the cones are, as in the fish, merely rods with swollen inner limbs. In the center of clear vision, where the pigmentary matter is absorbed in large quantities, all the elements are permanently of this character, but away from the center only one here and there has its inner limb enlarged. Borysiekiewitz refers this to the protrusion of the nucleus, but, as the nucleus is not always protruded, I prefer to refer it to an extrusion of fluid from the retina. Not only does the early protrusion of fluid vesicles from the retina in the first stages of rod formation make this probable, but also the fact that globules of fluid are continually escaping from the retina into the rods, as described. The striation of the rods has now been traced to its true cause, viz.: the existence of strands, sometimes taking stains, in the walls of the rod vesicles, while the lumina of these vesicles are occupied by a staining network in connection with these strands.

The refractive matter which fills the outer limbs of the rods is absorbed pigment, which is usually, but not always, clarified during the process of absorption.

The curious zone formation within the retinal syncytium has been traced largely to the above-mentioned lateral

movement of the nuclei of the middle layer from the rim toward the center.

The "Müller's fibers," however startling they may appear at their highest development, are merely streams of the pigment matter which have been absorbed by the rods and which, with many interesting variations of detail, pass inward through the retina, eventually to join the vitreous humor.

A Note on the Ophthalmoscopic Appearance of the Normal Fovea.

HANSELL, HOWARD F., Philadelphia. (*American Medicine*, Aug. 9, 1902.) Remarks on the minor amount of attention paid to the physiologic variation in the ophthalmoscopic appearance of the macula and foveal region compared with that of the optic nerve head and lays the cause to the personnel using the various hand ophthalmoscopes.

With the Thorner ophthalmoscope the fundus is seen under precisely the same conditions by each observer, and there is no room for differences of opinion as to details of the fundus picture. The average foveal region presents the following characteristics:

Size, including macula, circummacular zone and boundary, is about that of nerve head; shape round or slightly oval, with long diameters, horizontal, independent of the refraction, astigmatism is at once manifest by comparison of the terminal twigs of the vessels; the color depends upon the amount of retinal and chorioidal pigmentation, height of boundary, steepness of sides and degree of illumination. In the brunette the macula stands out as a bright yellow, circular dot; the circummacular zone deep red, the circumference is glistening and whole region of deeper pigmentation than that of rest of fundus. In the albino the boundary is indistinct or invisible, the macula less yellow, the intervening space light red. The grades of color between the African and albino vary from a light red to almost black. The foveal region excepting the macula is well provided with vessels.

Albuminuric Retinitis in Syphilis.

ZIMMERMANN, C., Milwaukee (*Archiv. Ophth.*, Sept., 1902, Vol. XXXI, No. 5), reports a case of retinitis with the characteristic fundus appearances found in albuminuric retinitis; reduced vision to O. D. 15/L; O. S. 15/XL;

urine contained considerable albumen; gave syphilitic history originating five years previously. Energetic anti-syphilitic treatment was exhibited with the result of obtaining V. =15/XV in each eye, the hemorrhages having been almost absorbed and the patient able to resume work.

Three years later O. V. =15/X; fundus entirely cleared up excepting a few stellate white spots in O. D.; urine still contained some albumen; patient died eight years after first consultation, death certificate giving degeneration of heart muscle as cause of death. Zimmermann thinks the brilliant result obtained by mercurial treatment in this case demonstrates not only that it was a case of albuminuric retinitis of syphilitic origin, but also the expediency of specific treatment of albuminuric retinitis in syphilis, although mercury and iodides are denounced in the usual routine treatment.

The Origin of a Visual Impulse.

EDRIDGE-GREEN, F. W., London. (*Brit. Med. Jour.*, September 13, 1902.) Dr. Edridge-Green said that light falling upon the retina liberated visual purple from the rods, and a photograph was formed. The decomposition of the visual purple by light, chemically stimulated the ends of the cones and a visual impulse was set up, which was conveyed through the optic nerve fibres to the brain. He assumed that the visual impulse caused by the different rays of light differed in character just as the rays of light differed in wave-length. In the impulse itself we had the physiological basis of light, and in the quality of the impulse the physiological basis of color. He assumed that the quality of the impulse was perceived by a special perceptive centre. Color was, according to this hypothesis, a point of difference perceived by a special centre independent of the visual centre, but closely connected with it.

He had examined the retina of several monkeys, and found visual purple in the yellow spot, which changed color when exposed to light. It was exceedingly difficult to see the visual purple in the yellow spot except under a microscope, because of the very bright yellow pigment which pervaded it. The fact which had already prevented the visual purple from being accepted as the visual substance was that it had not been found in the cones, and

that the most sensitive part of the retina, the fovea, contained only cones. But according to the hypothesis which he proposed it would be essential that there should be no visual purple in the cones, as these were sensitive not to light itself, but only to changes in the visual purple. He had made many experiments to show that light might fall upon the fovea without producing any sensation whatever. Helmholtz mentioned the fact, and also stated that it was remarkable that a perceptible interval elapsed before we saw with the yellow spot, the fovea being the last point to convey a sensation of light. This would be explained by the diffusion into the yellow spot of the visual purple. All the facts of color mixing, contrast, and after-images were consistent with the hypothesis that the visual purple was the visual substance.

He then passed to the perception of color by the brain, and this portion of the hypothesis was supported in the minutest particular by the facts of color blindness. Cases of color blindness might be divided into two classes. In the first class there is light as well as color loss; in the second class, the perception of light was normal, but there was a defect in the perception of color. Both these classes were represented by anologous conditions in the perception of sounds; the first class by those who are unable to hear very high or very low notes; the second class by those who possess what is commonly called a defective musical ear.

All the facts pointed to the view that the sense of light was developed first, and then the sense of color, those rays which differ most, physically, being the first to be differentiated. In the course of evolution all the varieties of psycho-physical color blindness had been passed through.

The existence of a separate color-perceiving center was supported by many pathological facts; several cases had been reported in which the perception of color was abolished whilst the perception of form and light remained unaltered. All objects appeared of different shades of grey, as in a photograph. In each case disease of the brain had been found. A similar condition could be produced by hypnotism. He had examined a case of general paralysis, in which the color vision became more defective as the

disease progressed; also a girl who became totally color blind, apparently from cerebral disease. Her color perception slightly improved, and then she was able to recognize the extreme red and violet with one eye and red and blue with the other, the intermediate color with both eyes being seen as grey. Violet was non-existent either as color or light to the eye which saw red and blue.

It was obvious that if the theory of the remission of a set of fibres did not explain the facts of color blindness, tests based on this assumption must fail to be efficient. This, indeed, was the case; no fewer than six varieties of the color blind might escape detection by Holmgren's test, and three of these varieties were dangerously color blind. In addition to this, a great many normal-sighted persons were rejected by this test. Of those who appealed from the decision of the Board of Trade, no less than 38 per cent. one year and 42 per cent. in another were found to have been rejected wrongly. The inefficiency of Holmgren's test was well known to all medical experts on the subject; in fact, none of his recent papers had met with any opposition, but were confirmed even by those who previously opposed him."

Concerning the Symptomatology and Etiology of Certain Types of Uveitis.

De Schweinitz, Geo. E., Philadelphia. (*Jour. Amer. Med. Asso.*, Sept. 20, 1902.) The writer spoke of the significance of the symptom keratitis punctata, a deposit of opaque dots, generally arranged in a triangular form upon the pasterior lamina of the cornea; three diseased manifestations are encountered to which the name is applied; (a) keratitis superfiicalis punctata; (b) keratitis punctata vera, vel syphilitica; (c) keratitis punctata. It has been noticed by many that when the characteristic deposits appear upon the posterior surface of the cornea recent patches of chorioiditis are found often and perhaps always exist in some portion of the fundus; in all varieties of iritis corneal lesions are always demonstrable by careful examination. The causes of uveitis may be diathetic, toxic or infectious; as rheumatism, gout and diabetes; syphilis, gonorrhea or tuberculosis; septic fevers and diseases of the blood. He spoke of the symptomatology of recurrent and malignant uveitis terminating in secondary

glaucoma and cataract and of the significance of the size, deposition and color of the deposits; of acute uveitis, beginning as a sclerotic-chorioiditis, especially in young subjects, terminating in myopia and posterior polar lenticular opacity; of chronic uveitis of mild type in elderly subjects associated with hemorrhage in the vitreous; relapsing plastic uveitis, with reference to the insidious approach of certain types in gouty and rheumatic subjects. In one form the primary lesion appears in the fundus as a well defined chorioidal change; in another class it appears first as a flitting conjunctival congestion, the hot eye of Jonathan Hutchinson, the vaso-motor dilation of Swan Burnett and the periodic episcleritis of Fuchs.

Injuries of the Eye Productive of Diseases of the Uveal Tract.

HANSELL, HOWARD, F., Philadelphia. (*Jour. Amer. Med. Asso.*, Sept. 27, 1902.) Apparently insignificant injuries are sometimes followed by most disastrous results and can be traced in every instance to either delayed or unwise treatment or some constitutional condition of the individual.

The writer concludes that:

"1. Injuries to the ciliary zone are always serious and often destructive of the usefulness of the eye.

2. The syphilitic, diabetic or tubercular diathesis delays recovery and renders the prognosis uncertain.

3. Diseases of the uveal tract the results of injuries are favorably modified by the energetic treatment of these constitutional affections.

4. Enucleation or one of its substitute operations is to be practiced immediately when a foreign body lies embedded in the ciliary region and can not be extracted, or when an eye is mangled beyond hope of redemption.

5. Conservative measures, such as cold compresses, antiseptic washes, subconjunctival injections, excision of prolapsed iris or ciliary body, rest in bed, restricted diet, morphia and other means to subdue inflammation should be the rule in other cases."

Analysis of Thirty-seven Cases of Uveitis.

WOODS, HIRAM, Baltimore. (*Jour. Amer. Med. Asso.*, Sept. 20, 1902.) The cases were studied from the standpoint of (1) visual symptoms with intraocular appearances, sudden and sometimes complete loss of sight, Decemi-

titis with metamorphopsia, photopsia, scotomas and muscæ; dim areas in field brought out by perimetric examination; (2) etiology; there were a small number showing syphilis, scrofula or rheumatism, intestinal or menstrual disorders, acute systemic infection and sympathetic ophthalmia; (3) relapses; the 37 cases indicate that menstruation in its establishment, or later, if abnormal, intestinal disorders, and nasopharyngeal disease are among the causes of plastic chorioiditis, either as direct causes or by altering the resisting power. Cases of obscure etiology show a greater tendency to relapses; the changes in so-called chorioidal hyperemia demand guarded prognosis and repeted examinations.

The Diagnostic Importance of Keratitis Punctata Interna. (Descemetitis.)

FRIEDENWALD, HARRY, Baltimore. (*Jour. Amer Med. Asso.*, Sept. 27, 1902.) Friedenwald said that keratitis punctata interna, or Decemititis, is observed in various vascular diseases, is found in every case of iritis, is an almost constant sign of exudative chorioiditis and sometimes found in syphilitic chorioiditis and acute and chronic cyclitis. When no other signs of uveitis are noted, except decemititis, it is due to carelessness in examination. The writer has reported 53 cases, and even including the earlier ones, in which the examination was not made with the thoroughness of later years and those in which opacities of the media prevented examination, about three-fifths had exudative chorioiditis. It is due to carelessness in examination that so many cases are recorded as serous iritis and serous cyclitis. Exudates in the anterior portion of the chorioid may be beyond the reach of ophthalmoscopic examination. We find Decemititis in chorioiditis only when there is exudative inflammation. "Serous iritis" and "serous cyclitis" have no clinical basis and the terms should be discarded.

The Treatment of Corneal Infiltration by Iodin-Vasogen.

DUANE, ALEXANDER, New York. (*Archiv. Ophth.*, Sept., 1902.) Duane gives his experience with iodin-vasogen, a non-irritating syrupy, brownish liquid, containing 5 or 10 per cent. of iodin in 19 cases, among which were 15 ulcerative cases; two of pannus with ulceration, one case of pannus (no special good effect being noticed in these 3),

and in one case of intese parenchymatous infiltration of the cornea with minus tension; in all of these with the exception of the three mentioned, a good result was obtained. It is applied with a cotton tipped probe, the tears being first mopped away; the reaction is very slight, rarely causing pain of any moment. He includes that:

(a) Iodin-vasogen is a valuable application in infiltrated and spreading ulcers of the cornea, whether associated with purulent conjunctival secretion or not. It is particularly indicated in those cases in which the galvanocautery is contra-indicated by the situation of the infiltrate.

(b) It rarely causes pain, if not applied in excess, and never causes any unpleasant reaction or untoward effects.

(c) Preliminary anesthetization of the cornea with cocain is rarely required, and in general is better omitted.

(d) The application is best made every other day, until the infiltrate begins to shrink decidedly, and then should be made every three or four days until the infiltrate disappears.

The Treatment of Serpiginous Ulcer of the Cornea.

KIPP, CHAS. J., Newark, N. J. (*Jour. Amer. Med. Asso.*, Aug. 9, 1902.) Kipp said that twenty years had now passed since he first observed that certain cases of serpiginous ulcer of the cornea in which no further progress was noticed after they came into his hands, presented the following features and healed under very simple treatment. From the margin of the ulcer straight lines diverge in all directions through the parenchyma of the deepest layer, not giving off branches and the further ends of which lines are connected by grayish intermediate striæ; if present all around these intermediate lines form a distinct ring, and if the ulcer is situated in the center of the cornea with these striæ well developed, the appearance might be compared to a spider's web. He considered that ulcers presenting this appearance had ceased to be progressive and that no treatment involving further destruction of tissue should be used. In cases where blenorrhea of the sac is present he splits the canaliculus, and if secretion is profuse, syringes it out with bichloride of mercury 1 to 1000; extirpation of the sac he has not found necessary. The only treatment required is warm fomentation and instillation of a mydriatic and the use

of iodoform as a dusting powder or a salve of bichloride of mercury 1 to 500–1000.

In cases where these linear opacities are not present he uses the galvano-cautery and iodoform powder; if much pain, abstraction of blood from the temple; fluorescine is used to determine the extent of the ulcer before using the cautery; if tension is high he perforates the floor and sometimes does paracentesis of the corneal margin, but prefers perforation with the cautery. The writer spoke of the hope held out by Dr. Roemar that we shall soon possess a serum which will arrest the progress of the pneumococcic ulcer when injected subcutaneously or applied locally.

Thiosinamine.

SUKER, GEORGE F., Chicago. (*Jour. Amer. Med. Asso.*, Aug. 9, 1902.) The author mentions the use of thiosinnamine as a resolvent of cicatricial tissue in the removal of keloids, lupus, urethral strictures and rheumatic joint affections, which led to experiments to determine its efficacy in ophthalmic practice. It is an active alterative belonging to the same group as potassium iodid and mercury, and its use is indicated in corneal opacities from any cause, cicatricial contraction of the lids, exudative chorioiditis, symblepharon, capsular opacities, and cicatricial ectropion. Experiments were made to determine whether it would prevent the maturing of cataracts, but no results of value were obtained. The best mode of administration is in three grain capsules once or twice a day. After the patient has been taking it for five or six weeks, it is well to intermit a week or ten days.

The drug sometimes produces vertigo when first taken, but lessening the dose, overcomes this disagreeable action. The therapeutic properties of the drug are as follows:

"1. It is a marked tonic.

2. It favors the absorption of exudates, transudates and infiltrates.

3. It clears up corneal nebulæ.

4. It produces local reactions without general systemic disturbances.

5. It reduces glandular swellings.

6. It causes cicatricial tissue to become soft and pliable.

In conclusion the writer presents a brief tabulated review of a series of cases treated during the last year with thiosinamin. In the report only the general results are mentioned.

1. Exudative chorioiditis, 6 cases; improvement in 4, none in 2.

2. Corneal opacities, very dense, 10 cases; improvement in 6 with visual improvement of varying degrees, none in 4.

3. Corneal opacities, nebulous, 8 cases; marked improvement in 4, both in appearance and vision; moderate improvement in 2, both in appearance and vision; no improvement in 2.

4. Plastic iritis 6 cases. Benefit in 2; no benefit in 3; slight benefit in 1.

5. Capsular cataract 3 cases. Not the slighest improvement in any (thiosinamin tried as an experiment).

6. Ectropion (moderate cicatricial) 3 cases. Improvement in 2; no improvement in the other.

Finally, the writer wishes to say that one is not to look upon thiosinamin as a panacea for every corneal opacity or other ocular lesion in which it is indicated, but that it, like other medicinal agents, is entitled to a due consideration in a certain class of cases."

(The drug should not be exhibited in cases where there are cicatrices from abdominal or hernia operation or where the scars act as a support.—Ed.)

Section and Exsection of the Rectus Muscles for Cosmetic Effect in Cases of Squint Inoperable by Tenotomy and Advancement.

PRINCE, A. E., Springfield, Ill. (*Am. Jour. Ophthalm.*, Sept., 1902.) The writer calls attention to the fact that he advocated this procedure in a paper read in 1888, but that the operation failed to receive sufficient attention at the time to lead operators to test its value, as is proven by the fact that cases present themselves from time to time in which competent oculists have failed to offer any plan of relieving the embarassment and mortification due to the cosmetic defect of paralytic squint.

"The purposes for which this operation may be performed are four in number: 1. Permanent atrophy of paralysis. 2. Irrecoverable loss of either rectus through accidental

section of the muscle back of its capsular perforation. 3. Extreme over-correction of long standing, following tenotomy with excessive laceration of the capsule, permitting the retraction of the tendon back of the equatorial meridian, whence, owing to atrophy or adhesions, it cannot be successfully advanced. 4. Irrecoverable traumatic dislocation of the rectus."

The histories of seven cases in which the deformity was corrected are given. The writer describes the procedure as follows:

"Operation. The amount of muscle to be excised must be determined by the operation in each individual case. In complete paralysis complete exsection will be required.

In all cases of partially atrophied muscles contracted in the orbit, some muscle should be left to oppose its remaining available efficiency. Common sense and good judgment will be required in making a correct estimate of the needs of the patient.

The eye should be held in position by an advancement suture when indicated. The operation I invariably use is the single suture operation, described in the *Ophthalmic Review*, September, 1887, and subsequently in the *Archives of Ophthalmology*, October, 1893. The interest which is taken in the operation (which is a necessary part of the operation in question in many cases of partial paralysis or over-correction) leads me to make the following extract from the *Archives of Ophthalmology* of the above date: "Not finding a satisfactory forceps in the market, Tiemann has filled this want for me. The introduction of a suture into the episcleral tissue is facilitated by a very slender, sharp, curved needle, with a comparatively large eye, designated by Tiemann as No. 25. Each will exercise his choice relative to a fixation forceps, but preference is given to that of Critchett, because, having two fine guarded points, the sclera is fixed directly without traction on the yielding conjunctiva. The suture preferred is fine, strong, black, iron-dyed silk, such as is furnished by Tiemann.

A conjunctival incision is made over and parallel to the attachment of the tendon of the muscle to be advanced. The tendon is secured by the advancement forceps, separated from the sclera and advanced, allowing the conjunctiva to retract.

A slender eye needle, half-curved (Tiemann No. 25) is passed from without forward, perforating the conjunctiva, muscle and capsule. It is then made to pass outward in the reverse order, from which it can neither slip nor escape.

The sclera now being fixed, preferably with Critchett's short fixation forceps (Weiss), an unyielding anchorage, in the form of a fibrous pulley, is secured in line with the rectus by introducing the needle into the dense episcleral tissue 2 mm. from the sclero-corneal junction.

Both ends of the suture are now brought together, forming the first portion of the surgical knot, and tightened to effect a slight over-correction. This may now be secured or provisionally held by the application of a bow-knot until the muscular tonicity shall have returned, thus enabling the effect to be modified at any time before adhesion has taken place. This suture is permitted to remain four days, unless it is desired to diminish the effect, which may safely be done after forty-eight hours, by removing the suture and opening the wound with a small strabismus hook."

The indication for a tenotomy of the opposing rectus are the same as those which constitute the guide in other operations for advancement.

Conclusions.—The conclusions suggested by the above are:

1. In the case of complete internal paralysis of either rectus, the exsection of the opposing muscle will enable the eye to be retained in the straight position without motion in that meridian.

2. In a case of retraction of either rectus muscle into the orbit, under conditions rendering its advancement impossible, an equalization of the deviating power is to be obtained through section of its antagonist, posterior to its capsular attachment, following which, excursions in that meridian will be restored to an extent varying between twenty and fifty degrees.

3. In case of paralysis or retraction of either rectus, the operation of section or exsection of its antagonist has not been observed to develop or increase any pre-existing exophthalmus to any marked degree."

The Present State of Our Knowledge Concerning So-Called Partial or Graduated Tenotomies and Heterophorias.

COLBURN, J. ELLIOTT, Chicago. (*Jour. Amer. Med. Asso.*, August 16, 1902.) The conclusions reached after reviewing the subject are:

"A small group of men, some of them with extensive experience, condemn the operation as needless, harmful and unsurgical. Another group, and still a smaller one, consider it the only cure for heterophoria.

A large group of men of most conservative habits of thought, voice the following conclusions:

1st. No person should have tenotomy performed solely because he is the subject of heterophoria.

2d. Very slight degrees should be corrected where troublesome symptoms exist which may be due to the too great use of nervous force on co-ordinating the eyes.

3d. Other means should be resorted to before trying tenotomy, but *unnecessary delay should be avoided.*

4th. Tenotomies should be performed under cocain.

5th. In judiciously selected cases, when the operation is properly performed, the average results will be quite as satisfactory as the results of most other surgical operations.

It is a mistake to deny that any good can come of a graduated tenotomy. It is always a mistake to claim that all of the ills that flesh is heir to are to be cured by cutting the muscles of the eye.

Others ignore the subject entirely, professing to know nothing about it, and to consider it as unimportant.

Colburn's opinion is that graduated tenotomy can be so done as to correct a true heterophoria without in any way interfering with the range or the nicety of adjustment of the eye, but rather to correct its error and produce orthophoria. The opponents of the operation give no valid reasons why it should not be performed. The uncertainty of the results of prism drill or ocular gymnastics, the loss of time and the danger from relapse render the physical culture treatment, in cases of true heterophoria, unreliable. Correction with prisms may answer the purpose in certain cases, but the error must be of low degree, and unless the patient has an error of refraction, necessitates the use of glasses which otherwise may not be required.

Colburn's experience is in accord with that of Hotz, Stevens, Standish, Webster, Savage and others that "operative treatment is the only cure for certain cases of heterophoria and its dependent symptoms, and that it should be resorted to as soon as the condition of structural imbalance is determined."

The Treatment of Sclero-Keratitis.

SANDFORD, ARTHUR W., Cork. (*Brit. Med. Jour.*, Aug. 16, 1902.) Sandford believes "this affection pure and simple to be an extremely rare one and that, with few exceptions, it was a local manifestation of acute rheumatism or of some more or less modified form of tuberculous infiltration and that it did not differ essentially from similar affection of other fibrous capsules, as of joints and testes; its importance in the eye consisted in the extension to episclera, iris, uveal tract, etc., whereby vision might be seriously diminished. As a rule these complications had set in before treatment was applied for, which complicated matters. A large proportion of cases occurred in adolescence in association with other scrofulous evidences and in females with menstrual irregularities; in adults it was rarely disassociated from constitutional rheumatism or gout. In those acute cases which were not tuberculous in origin he had found useful hypodermic injections of pilocarpin and dosing with salicylate of soda or asperin, the eye being kept quite at rest, warm, and dry. Iritic complications needed atropin, but he felt this was to be avoided as much as possible. In scrofulous cases rest and warmth to the eye, doses of iodid of potassium with iodid of iron and tri-iodid of caffein with a generous dietary, or the use of bichlorid of mercury in small doses were useful even apart from specific taint. His experience of subconjunctival injections was not favorable; in some cases the reaction was severe and probably hurtful. On subsidence of the affection the thinned sclera and opaque cornea had to be considered; for this long use of weak myotics and weak mercurial ointments and massage appeared to promote tissue change. The results he felt were not thoroughly satisfactory since the affection was tedious and had a marked tendency to recur."

Annular Scleritis.

PARSONS, J. HERBERT, London. (*Ophth. Review*, July,

1902.) The writer gives a résumé of our knowledge of this severe type of inflammation first described in 1897 by Schlodtmann, under the title, "Sulzige Infiltration der Conjunctiva und Sklera."

"It is impossible, pathologically, to draw any hard and fast line between the deeper forms of conjunctivitis, or episcleritis, and scleritis. In the very limited number of cases which have been examined microscopically, the general type of infiltration has been characteristic, but the relative extent has varied considerably, and apparently out of all proportion to the apparent clinical severity. even clinically, episcleritis merges into scleritis, and the latter, though usually nodular like the former, is invariably more diffuse, and less commonly invades the whole circumcorneal area. The severer cases grouped together by German authors under the term "brawny infiltration of the sclera" invariably infects the whole region around the cornea; and as the German nomenclature is not very satisfactory, I propose to use the term "annular scleritis."

Unlike ordinary scleritis, which usually attacks young adults affected with tubercle or congenital syphilis, annular scleritis is a disease of advanced age. All the cases recorded have been in patients over 60 years of age, and most of them were women. Both eyes are usually affected, though often to a very unequal extent. The progress of the disease is extremely chronic, with periodic exacerbations and remissions. The prognosis is very bad, most of the eyes being lost; hence the comparatively large number which have been examined microscopically, as compared with ordinary scleritis, pathological reports of which are extremely rare.

The locality and extent of the infiltration is characteristic. Even when typical scleritis invades the whole circumcorneal area it leaves the limbus itself free, thus differing from phlyctenular nodules. Here, on the other hand, the corneal margin is the essential site of the affection, and from this spot the infiltration spreads on both sides into the neighboring tissues, having a sharp edge on the side of the cornea, which it partly overlaps, and gradually passing into normal tissue on the side of the sclerotic. In advanced cases, extension continues in each direction, so that it reaches the equator posteriorly, but never much

exceeds this level, whilst anteriorly it invades the cornea as a peripheral sclerosing keratitis, ever advancing toward the center.

The appearances of the infiltration were sufficiently characteristic to lead Schlodtmann to identify the complaint by them. In other cases, the existence of the scleritis has only been discovered subsequently to the removal of the eye. In typical cases the swelling is gelatinous and succulent and has a brownish-red color.

Besides the cornea, the uveal tract is usually inflamed, especially the anterior part of the chorioid and the ciliary body. As in the case of ordinary scleritis, discussion has arisen as to whether this uveitis is secondary to the scleritis or casual. In each case it is probably a secondary phenomenon, sometimes a true sequel, and others a mere concomitant."

The Role of Scleral Scars in Operations for Glaucoma.

ANDOGSKY, N., and SELENSKY, P., St. Petersburg. (*Archives of Ophth.*, Sept., 1902.) After a resumé of the literature, the authors find many writers who have accepted de Wecker's "Permeability of Scleral Scars," while others have rejected it, and they have endeavored to decide the question by experimental means.

The scars were studied microscopically and micro-chemically, at from 8 to 145 days after the operations; injections of 5 per cent. citrate of iron or India ink emulsion were made into the anterior chambers under pressure.

"The results of our experiments show that, under certain conditions, the scars following sclero-corneal sections influence the excretion of aqueous humor, in that, for a time, the current is accelerated in the region of the scars. This was shown not only in a clinical picture after injections of India ink, but by microscopic examination.

"The permeability depended greatly upon the age of the scar. When 8 to 14 days old, the passage of pigment was very evident; when 21 to 40 days old, but little pigment was found in the scar and in the subcutaneous tissue; and when 40 to 145 days old, no trace of filtration could be discovered.

"All scars had in common the formation of intercalary tissue, although the quantity differed in different cases. Small scars were observed and more extensive

ones and, at times, scars of cystoid structure, due to the inclusion of iris tissue. The broad and loose scars contained more pigment than the narrow and dense ones.

"Our conclusions, therefore, are that scleral scars possess a certain permeability at a particular stage of their development, but not in the degree claimed by the adherents of the infiltration scar theory."

The fact that the scars in glaucomatous eyes form in eyes with increased tension and not, as in the experiment, in eyes with normal tension, does not concern the authors. "The only means providing a direct artificial channel of exit, conveying aqueous humor into subconjunctival space for an extended time or permanently, lies in the development of a permanent scleral corneal fistula, which is more likely to occur after an iridectomy with incarceration than after a properly performed sclerotomy."

The truth, therefore, appears to lie midway between the claims of the advocates and the objections of the opponents of sclerotomy, and is complicated by the varying anatomical conditions in different cases, the technique of operation and cause of recovery not always being the same.

In regard to the curative effect of the recently proposed incision of the chamber angle, "it must be regarded as an operation which for a short time provides an artificial channel of exit for the aqueous humor, and probably exercises only an indirect influence upon the restoration of the normal channels."

Histology of Scars Following Posterior Sclerotomy.

MELLER, J., Clinical Asst. Prof. Fuchs' Clinic, Vienna. (*Archiv. Ophth.*, Sept., 1902.) The writer gives a resumé of the literature and the histological findings in two cases of glaucoma in which the eye was enucleated three and six months, respectively, after posterior sclerotomy had been performed. Both showed the scar to be a narrow strip of nuclei breaking the continuity of the scleral fibers; the margins of the chorioidal and retinal wound were retracted but united with scar tissue, while the margins of the scleral wound were in apposition and united without the intervention of scar tissue. The older the scar, the denser and less permeable it is.

Meller concludes: "There can be no question of filtra-

tion through the scars described. In the first case the scar was three months old, in the second, six months old. The older a scar, the denser it is and the less permeable. Andogsky and Selensky found in their experiments on rabbits that scleral scars were permeable in the beginning only, and they assumed the same to be the case in man. Our histological examination has fully confirmed their assumption."

The Modern Treatment of Pterygium.

LORING, F. B., Washington. (*Med. News*, Aug. 2, 1902.) The writer callls attention to the fact that pterygia, particularly when there is no pain or discomfort, are usually allowed to progress, and the patient does not generally seek relief until the anomaly has encroached upon the cornea, with resultant interference with vision. The apex of the pterygium is not the boundary of the disturbance in the corneal elements; there is a patch of haziness beyond it; even when this is not apparent by examination, irregular refraction may be produced. On this account, it is not always safe to postpone operative intervention because there is a band of seemingly clear tissue between the growth and the margin of the pupil.

The many operations and modifications of them are briefly reviewed under the headings: Excision, Transplantation, and Ligature. The objections to these methods are: (1) The stripping of the growth from the cornea "leaves a denuded spot, which extends, during the process of repair, beyond the original wound, and is seldom, if ever, absorbed;" (2) the bulk of the remaining conjunctival mass presents not only a disfiguring appearance, but, from its shrinking into tendinous bands, often leads to a feeling of traction that impedes the motion of the eye, gives rise to discomfort, and may cause a dense and prominent cicatrix, sometimes requiring a subsequent operation; (3) loss of time and interference with the patient's business, also suffering and expense of a tedious convalescence.

The writer advocates the direct application of cautery to the apex of the pterygium on the cornea, leaving the rest of the body to take care of itself—a procedure introduced by A. Coe, of Washington; this minor surgical operation is painless, is not followed by inflammatory

reaction, there are no sutures to be removed nor wounds of a protracted nature to be healed, and there is no loss of time or occupation for the patient. Speaking of Coe's case, the writer says:

"The case presented had been operated on some months before and the cautery had been applied at intervals of a few days, the first application being made to the center of the apex and the two subsequent ones laterally. The instrument used was a platinum wire with a bulbous head of about the size of a small pea, and the results of this, the initial case, were most satisfactory. There was still a white opacity—where the apex had rested on the cornea, but the tissues up to that point were clear and transparent, and the opacity itself was evidently much thinner than it had been, and there was a great reduction in the size and vascularity of the pterygium. Since then I have used this method in twenty-three cases, and with complete success, except in one case, which was very large and vascular, with a central vessel of considerable size that I ligated, the only case in my experience in which the cautery, alone and unaided, has not proved sufficient.

"The operation is simplicity itself; all that is required is an alcohol lamp and a platinum wire; the latter I have changed from a bulbous point to a hook of about three and a half millimeters in width, and one in thickness mounted on a wooden handle. After the eye is thoroughly under the influence of cocaine, I press the bottom of the convexity heated to a white heat against the point at which the apex protrudes above the surface of the cornea, on the pupillary side, and then, elevating the handle, bring the rest of the platinum to bear in a direction parallel to the axis of the pterygium from the apex toward the base. One application of the cautery, if thoroughly done. is generally sufficient, and my habit has been, when it has been possible, to put the eye through a preliminary course of treatment with Pagenstecher's ointment of the yellow oxide of mercury to reduce the vascularity and to decrease the size of the growth as far as possible before operating. This is again continued a few days after the throwing off of the eschar, vaseline being substituted for the hydrated gly-

cerole of starch as a menstruum, as it produces less pain and subsequent inflammation."

The Nature and Treatment of Pterygia.

McReynolds, John O., Dallas, Texas. (*Jour. Amer. Med. Asso.*, Aug. 9, 1902.) That pterygia are peculiar to those past middle life, as described by Prof. Fuchs, may be true of Vienna, it is not true of the southwestern part of the United States, as it is not infrequent to see boys with pterygia. The cause is attributed to the heat, dust and high wind; these factors cause the tears to evaporate so rapidly that they cannot accumulate in sufficient quantity to wash away the foreign particles which heap up in the palpebral fissure and act as a constant irritation.

"The details of the operation are the following: 1. Grasp completely the neck of the pterygium with strong but narrow fixation forceps. 2. Pass a Graefe knife through the constriction and as close to the globe as possible, and then with the cutting edge turned toward the cornea, shave off every particle of the growth smoothly from the cornea. 3. With the fixation forceps still hold the pterygium, and with slender, straight scissors divide the conjunctiva and subconjunctival tissue along the lower margin of the pterygium, commencing at its neck and extending toward the canthus, a distance of one-fourth to one-half of an inch. 4. Still hold the pterygium with the forceps and separate the body of the growth from the sclera with any small non-cutting instrument. 5. Now separate well from the sclera the conjunctiva lying below the oblique incision made with the scissors. 6. Take black silk thread armed at each end with small curved needles and carry both of these needles through the apex of pterygium from without inward and separated from each other by a sufficient amount of the growth to secure a firm hold. 7. Then carry these needles downward beneath the loosened conjunctiva lying below the oblique incision made by the scissors. The needles, after passing in parallel directions beneath the loosened lower segment of the conjunctiva until they reach the region of the lower fornix, should then emerge from beneath the conjunctiva at a distance of about one-eighth to one-fourth of an inch from each other. 8. Now, with the forceps lift up the loosened lower segment of conjunctiva and gently exert traction upon the free

ends of the threads, which have emerged from below, and the pterygium will glide beneath the loosened lower segment of the conjunctiva, and the threads may then be tightened and tied and the surplus portions of thread cut off, leaving enough to facilitate the removal of the threads after proper union has occurred.

It is very important that no incision should be made along the upper border of the pterygium, because it would gap and leave a denuded space when downward traction is made upon the pterygium."

An Operation for the Restoration of a Cul-de-Sac for the Wearing of an Artificial Eye, with Report of Cases.

WEEKS, JOHN E., New York. (*Jour. Amer. Med. Asso.*, Aug. 23, 1902.) The writer spoke of the difficulty of establishing a cul-de-sac, the various operations, and said various kinds of tissue had been transplanted; a flap of integument or mucous membrane being most frequently used. Partial success has attended all, but, because of shrinking, there is usually loss of the primary favorable result.

The operation that the writer has performed with unvarying success is as follows: One cul-de-sac only is restored at a time, for fear of sloughing and the time required, necessitating too prolonged anesthesia.

"The lid, upper or lower, as the case may be, is dissected from the orbital tissue, leaving the greater part of the conjunctiva (if conjunctiva is present) on the orbital surface. The tissue attached to the lid should be no more than enough to include the fibers of the orbicularis palpebrarum muscle; the dissection should be carried downward to the tissue just above the periosteum at the margin of the orbit." A free canthotomy may be necessary.

"The groove, or sac, formed by the dissection may be carried outward so as to include the portion exposed by the canthotomy. Having completed the groove, bleeding, which is little more than oozing from small vessels, is controlled by packing with aseptic absorbent gauze. A protective pad is applied.

"The thin skin on the inner aspect of the arm is selected for the flap. By measurements quickly made the size and shape of the flap can be determined. The area of the flap before removal should be at least one-third

larger than the defect to be covered. The area from which the flap is taken should be rendered aseptic some hours before the ope.ation and an aseptic dressing applied. In removing the flap care should be observed to remove the skin only; if subcutaneous tissue to any amount is detached, the flap will be too thick. After the flap is separated from the arm it is placed in a warm, sterile, normal saline solution on a piece of plain absorbent gauze. Should subcutaneous tissue be found on the flap, it should be trimmed off. This can be done by means of a pair of curved scissors, the flap being stretched over the thumb or index finger. The flap is now folded with epithelial surfaces in apposition. Three long sutures of No. 5 black silk, each armed with two needles, are now passed through the flap at the bottom of the fold, so that each suture forms a loop on the epithelial surface two millimeters long and at equal distances from each other. The flap, contained between two pieces of absorbent gauze which have been dipped in warm, normal saline solution, may now be permitted to rest on the brow or cheek. The needles of the middle suture, carried separately into the bottom of the groove at its central portion, are made to engage the periosteum at the margin of the orbit and pierce the integument of the cheek (or of the brow when the upper cul-de-sac is being restored) about 2 mm apart. The lateral sutures are placed in their proper position in the same manner, and the flap is then drawn down into position, the sutures being tied over small rolls of gauze. The margins of the flap are now sutured to the margins of the defect by interrupted sutures of No. 3 black silk.

"After having secured the flap a plate of some sort is necessary to maintain it in proper position. Every case requires a shell of different size and of different shape, and the size and the shape must be changed as healing advances. It is, therefore, desirable to have the plate made of a material that will permit the making of these changes. Glass, celluloid, hard rubber and the metals are objectionable, because they do not possess the desired qualities. In rubber tissue of the kind ordinarily used in surgery, we have an excellent material for this purpose. About sixteen layers of rubber tissue are made to adhere together by first superimposing them, then dipping the plate so

formed in warm water of a temperature of 120 to 130 degrees F., and subjecting it to pressure. This forms a plate which is sufficiently stiff and can be cut to any shape. When cut to the desired shape the edges may be sealed by means of a hot strabismus hook dipped in vaselin. The plate is well lubricated by means of bichlorid vaselin, 1–500, and is then placed in position, a piece of rubber tissue is placed over the lids, leaving space at the inner and outer canthi to permit of the escape of secretions, and an antiseptic dressing applied. The wound is inspected at the end of the third to the fifth day, but unless there is evident of sloughing the plate is not disturbed until seven or eight days have elapsed, when it is taken out, sutures removed, the sac and plate cleansed, the plate replaced and the bandage reapplied. An artificial eye may be introduced at the end of two or three weeks."

Dr. Weeks reports five successive cases, in three of which the cul-de-sac was formed above and below, all of which were successful. (A great deal of work has previously been done along this line by Hotz and May.)

Tuberculosis of the Conjunctiva.

Bordley, James, Jr., Baltimore. *(Ophth. Rec.*, July, 1902.) Although foreign writers claim conjunctival tuberculosis is not a rare affection, Bordley has only been able to find 84 reported cases and believes "that a more thorough microscopic study of so-called simple ulcers and polypi of the conjunctiva would show a larger percentage of tuberculosis."

A resumé of 84 cases collected by the author since 1870, shows: "Most of the infections occurred in people ranging from 10 to 30 years. Still there is apparently no age limit, cases having been reported in which the age varies from 8 months to 62 years. Of the two sexes, the female seems to be slightly more prone to the disease, 62 per cent. of the cases having occurred in girls and women. The general bodily condition played an important role, shown by two facts—first, a total of twenty-one cases, or 25 per cent. of the number recorded, followed an infection primarily in some other part of the body; second, in 10 per cent. of the cases of primary origin in the conjunctiva the health was poor. An accident, either recent or remote, was assigned as the cause of infection in fifteen cases. Two cases

followed operations performed for the relief of strabismus, and one case developed as a tarsal cyst. The right eye is apparently affected slightly more often than the left, the proportions being 47 per cent. for the former, 40 per cent. for the latter and 13 per cent. for both eyes. The lesion originated in the conjunctiva of the upper lid in $33^1/_2$ per cent. of the cases, in that of the lower lid in $15^1/_2$ per cent., in the bulbar conjunctiva in 12 per cent., and in the palpebral and bulbar conjunctiva in 6 per cent."

Sattler's classification of cases is considered the best, as follows:

Group I. "Small miliary ulcers which may coalesce, generally attacking the palpebral, but sometimes the bulbar conjunctiva."

Group II. "Subconjunctival nodules, not unlike the sago granules of trachoma."

Group III. "Florid hypertrophied papillæ and rounded outgrowths of granulation tissue, situated in the fornices and springing from the palpebral conjunctiva. The granulations are accompanied by edema of the lids."

Group IV. "Lupus of the conjunctiva, characterized by pedunculated excrescences in the fornices, of a jelly-like consistency."

Group V. "Pedunculated tumors having the macroscopic appearance of papillomata, and those designated by Mitvalsky as 'true polypus of the conjunctiva.'"

Pain was either insignificant or wanting; lacrimation or discharge, very slight.

Diagnosis must be confirmed by microscopical finding, culture and inoculation tests, as in several cases where bacilli were not found in the growth or resulting secretions they rapidly developed when inoculation experiments were carried out on rabbits and guinea-pigs.

As to prognosis, "there were enough recurrences and deaths to justify a guarded prognosis."

Surgical treatment is the only means which gives satisfactory results. The sharp curette, followed by lunar caustic or actual cautery—this, with constitutional treatment and eye-washes, make up the list.

Two cases are reported, with illustrations.

The Removal of Foreign Bodies from the Eye.

HAAB, PROF. O., Zürich, Switzerland. (*Jour. Amer. Med. Asso.*, Aug. 30, 1902.) Prof. Haab spoke favorably of the Desmarres capsule forceps for removing foreign bodies from the interior of the eye, saying that they caused but a slight wound and injured the vitreous as little as possible, but they were only of use when the splinter was free and visible in the vitreous. That we possess valuable aids in the diagnosis of foreign bodies in the X-ray and sideroscope, but they required much skill and patience in their use, and could be almost dispensed with by use of the large magnet. He described in detail the use of the large magnet in the extraction of various foreign bodies from the eye, which, with him, in 165 cases had failed only 25 times, and in these cases the failure was due to the body being too firmly embedded in the posterior wall of the globe or to having pierced it completely; situated in the ciliary body; having produced fibrinous purulent exudate; or had been healed over for months or years. He had never observed any risk in its use and did not deem it necessary to have three different sizes, as advised by Hirschberg, the large magnet answering for all cases. In this country the large magnet was used almost immediately upon its introduction, and with success.

Foreign Bodies in the Eye.

SWEET, WILLIAM M., Philadelphia. (*Jour. Amer. Med. Assc.*, Aug. 30, 1902.) Dr. Sweet said the majority of injuries were now due to iron or steel, but occasionally small shot, pieces of copper, glass and coal are the cause. That a small wound of the cornea with opacity of the lens is almost positive proof that the foreign body has passed into the interior of the eyeball and been retained; when there is cloudiness of the media the X-ray is the most accurate means of diagnosis; excellent results have been secured with the sideroscope, but owing to its delicacy it has a limited usefulness. The lower power of the Hirschberg magnet necessitates the introduction of its point into the vitreous, and therefore the large magnets are now more generally used. A chart was given showing the attractive power of the different magnets and demonstrating the superiority of the Haab magnet. If the wound of the entrance had closed, it was better to extract through

an opening in the sclera. The after treatment should consist of cold, supplemented by atropia.

Two Noteworthy Cases of Extraction of Iron from Vitreous Chamber by Means of the Giant Magnet--A New Procedure.

KIPP, CHARLES J., New York. (*Arch. Ophth.*, July, 1902.) The writer, by reversal of the poles of the magnet, i. e., turning it around on its pivot, succeeded in dislodging and removing through the wound of entrance a piece of iron 18 mm. long and 2 mm. wide, and weighing 10 mg., that could not be moved with magnet in its original position.

The second case is noteworthy because of the complete clearing up of the lenticular opacity following the passage through it of a foreign body.

An Additional Case of Amblyopia with Central Color Scotoma and Defective Color Perception Following the Ingestion of Jamaica Ginger.

BURNETT, SWAN M., Washington (*Ophth. Rec.*, June, 1902), reports a case of a robust German, subject to periodical attacks of dipsomania, who took about 1½ ounces of Jamaica ginger; within 48 hours vision became foggy and he was unable to read; he gradually recovered ability to read, but all objects had a "gray look." Several months later he took about half as much after which vision was deteriorated. Patient is myopic, V. with correction being O. D, 5/XV; O. S. 5/XXXV; V. F. form for white practically normal; blue fairly good field; red field reaches near blue with O. D. A circular central scotoma for all colors except blue in right. Blue is the only color that retains its former brilliancy. Green he can discriminate with the right eye in large quantities but it is confounded with browns and grays; red is recognized somewhat better with O. D., but is not always distinctly red.

Two others took respectively three and four bottles and and only complained of a certain amount of fogginess of vision which was not permanent.

"Scientifically, the point of importance in this as well as other forms of toxic amblyopia, is as to the location of the primary lesion. The new theory of the initial lesion being in the ganglion cells of the retina, is pushing the old one of retro-bulbar neuritis very hard for acceptance, but for its final adoption much clearing up in evidence is

necessary. So far as the ganglion degeneration in quinin poisoning is concerned, this may be well explained by the reduced nutrition attendant upon the diminished blood supply due to the spasm of the retinal vessels, though the escape of the macula lutea, whose vascularization is poorest, is a stumbling block not easy to get over. No such vascular change is noted, however, as an effect of methyl alcohol. The visual fields of the two forms are quite dissimilar if the case here reported shall turn out to be typical. In quinin amaurosis there is a marked contraction of the visual fields for white, but rarely a central scotoma. The color sense may be at first considerably affected, but usually returns later, certainly in the milder forms. In the case here reported there is a central scotoma for all colors, except blue in the least affected eye, and the general perception of other colors except blue is either absent or not of a normal character. Corresponding with this scotoma for colors there is also a reduction of form sense as shown by the diminished visual acuteness. All these conditions point rather to a neuritis affecting principally the papillo-macular bundles, but at the same time, not sparing the others, as shown by the affected color sense all over the field."

Two Cases of Hysterical Monocular Diplopia.

ZIMMERMAN, M. W., Philadelphia. (*Ophth. Rec.*, July, 1902.) The first case is a girl aged 15, apparently in perfect mental and physical health, and had constantly for four years vertical diplopia in the left eye or with both eyes open, three images remaining so from distance of 20 feet to reading point. With right eye closed and passing graduated colored glass before the left, one of the images would disappear near the dark end of a pale blue glass and near the light end of a strong ruby glass, the lower image always remaining. The patient seemed to ignore the multiple images except when out of doors her habit was to use the right eye, being unable to close the left one alone. In reading, if the page is held very close, the images become imperfectly fused and are less annoying. When seen last after several months' time, the condition remained the same.

The second case was one of periodical diplopia of the left eye, which remained unchanged after refraction and treatment.

"Hysterical monocular diplopia has been recognized, more especially in connection with trumatism, but my diagnosis in these cases is mainly by exclusion. Confirmatory evidence of hysteria was entirely absent in the second case, and limited to the characteristic behavior of the color perception limits in the first. In support of my diagnosis, however, I would offer as valuable evidence of a negative character, the complete absence of optical and mechanical causes within the eyes, such as dislocated lens polycoria, iridodialysis, distortion and opacities in lens and cornea, etc. Also the entire lack of evidence pointing to coarse disease of the central nervous system. Neither patient had sustained any serious injury, even remote."

A Case of Traumatic Enophthalmos.

KILBURN, H. W., Boston. (*Archiv. Ophth.*, July, 1902, Vol. 31, No. 4.) Kilburn reports a case of man, age 53, being thrown from a sleigh, striking on left shoulder and left side of face, breaking glasses and lacerating upper lid, cuts not extending through lid. Ten days after accident enophthalmos and ptosis on left side were noticed. V = 6/IV in either eye with correction on, orthophoria vertically, esophoria 2°. The author is inclined to agree with Shoemaker, that the cause of the condition is a rupture of Tenon's capsule or the thickened bands of this, known as the check ligament, and as this contains smooth muscular fibers which are innervated by the sympathetic, a peripheral or central lesion of this would cause relaxation of the smooth muscular fibers of the check ligaments and also atrophy and absorption of the orbital cellular tissue which permits the eye to sink backward according to the theory of Beer.

A Case of Vicarious Menstruation from the Lower Lids.

CLAIBORNE, J. HERBERT, New York (*Jour. Amer. Med. Asso.*, Sept. 13, 1902), reports case of Jewish girl of 16 who, since the establishment of her menses at 13 years of age, noticed each month, two or three days before her period, a red spot appear under each eye; the skin becomes red, the blood rises to the surface, finally oozes through and forms a clot, which dries and forms a crust. This lasts during her period, disappearing gradually. She was pale, flabby and badly nourished, otherwise well. No

change in phenomena noticed under treatment. The article is well illustrated.

The Prognosis of Myopia.

VALK, FRANCIS, New York. (*Ophthalmic Record*, Aug., 1902.) The writer is convinced that, in myopia, the curvature of the cornea bears a decided relation to the condition of the posterior part of the eye and the innocence on malignity of the myopia. He selects from his histories the last one thousand cases and finds about 11 per cent. myopic, from 12 to 64 years of age, and from an analysis of these shows that in the majority of cases of high myopia those showing a sharp curve in the cornea have no change in the myopia or at the posterior part of the eyeball, while those with a very long radius of curvature show changes in the posterior part of the eye and progressive condition. He concludes: "If we accept the relation between the curve of the cornea and the refractive condition and that the majority of our cases will show a shorter radius in both meridians than the normal curve, then we have some reason for the statement that, in myopia of any degree, if the radius of curvature is less than 7.65 mm., we have a case of refractive myopia and not an elongation of the eyeball. That the prognosis will be, in all reasonable possibility, that the myopia will not increase. Then, with full correction, our patients may continue their studies or use of the eyes with every prospect of good and useful vision. Furthermore, that with a reduced curve, showing a longer or normal radius, with any degree of myopia, then we have for consideration a case of axial myopia that may tend to increase even to serious impairment of sight. These cases must have full correction of the myopia with an examination of the refraction and glasses every six months or a year. If, in time, we detect any increase in the myopia, then our patients must be cautioned in the use of the eyes, but a decided increase will call for the use of atropin, if necessary, and the entire cessation of the use of the eyes at any work calling for close application, until the refraction remains stationary for at least a year. Hence, in this class of cases the close observation so frequently urged upon the profession by our many writers is very necessary and urgent, while in the cases of refractive myopia we may allow the use of the

eyes, within reasonable limits, with confidence that we are dealing with an innocent myopia which will give useful vision during life."

Rodent Ulcer: Its Pathology and Treatment.

McFeely, J. D., Dublin. *(Med. Press*, Sept. 3, 1902.) The writer discusses the pathology of this affection and concludes that rodent ulcer is not an epithelioma of the skin, pure and simple; he gives the reasons for this view. After maintaining briefly some of the recognized means of treatment, both operative and non-operative, he describes a new procedure—the use of formalin.

"The treatment I adopt in case the ulcer is not very large, or easily accessible, is, in the first instance, pure formalin; if a second or third application seems necessary later, formalin glycerin 30 to 50 per cent., with or without tannin.

"In case the patient objects to be anesthetised, I first use a local anesthetic, either cocain, eucain, or, better still, acöin; giving a hypodermic of morphia in five or ten minutes after using the application, if the pain is severe. After this the patient is generally asleep in fifteen or twenty minutes.

"In cases where the disease is of long standing, and likely to engage the bones or be accompanied by extensive destruction of tissue, or, if not readily accessible, I prefer to anesthetise the patient and remove by knife or curette all available diseased tissue, and apply as a styptic either powdered tannin or suprarenal gland extract to stop oozing and facilitate the formation of eschar, and then use formalin or formalin glycerin, keeping the patient fully under the anesthetic for about five minutes afterward. When the formalin is applied it should not be allowed to evaporate. If pure formalin be used in the first instance I rarely find a second or third application necessary, unless to some isolated patches; but I should strongly recommend any person not to hesitate to use it as often as may be necessary to remove all diseased tissue. Herein consists the success of the treatment.

"The dark, I might say black, slough which forms should be allowed to separate spontaneously, and may be assisted by some non-irritating ointment, etc. After, or very often before, this slough or eschar has separated, the

granulations will soon sprout up and, if healthy, grow vigorously. The rate of growth of the healthy margins is sometimes marvellous."

The Symmetry of Our Visual Apparatus as a Dual Organ.

KNAPP, HERMAN, New York. (*Jour. Amer. Med. Asso.*, Sept. 13, 1902.) The author makes a plea for a change in system of notation of the axis of astigmatism and meridians of the visual field.

The visual apparatus being a dual organ, symmetrically placed on both sides of the median line of the body, Dr. Knapp's purpose is to place zero at the end of the horizontal meridian of both eyes. The change from the old system would require: 1, a new plate on the spectacle frame for the left eye, placing zero on the nasal and 180 on the temporal side; 2, a diagram of the prescription with the same change for the optician; 3, perimeter charts marked in the symmetrical way.

The Misuse of Glasses.

HOTZ, F. C., Chicago. (*Med. News*, Aug. 16, 1902.) The writer gives the histories of a number of patients upon whom superfluous and useless glasses had been inflicted, the discomfort caused by conjunctivitis and blepharitis having been mistaken for asthenophia.

He advises that in healthy young adults, especially if they have not suffered from asthenopic complaints during school life, we should always make a most searching examination of the conjunctivia before we suspect a slight refraction error as the cause of the patient's complaints; this may avoid the prescribing of useless and unnecessary glasses. "The great demands our schools put upon the vital forces of a child, together with the greater susceptibility of the nervous system of the growing organism, render the period of adolescence an especially favorable field for the display of the disturbing effects of ametropia upon the nervous system. Slight degrees of ametropia are a prolific source of headaches during this critical period in life; and we have frequent occasion to correct slight degrees of ametropia for the relief of asthenopic symptoms in school children. But many of these children after leaving school, if in perfect health, can discontinue the use of their glasses without suffering any inconvenience or discomfort, though their refraction errors

have remained unchanged. This only goes to prove that the nerve forces of a normal young adult are abundantly able to meet the special demands of moderate degrees of ametropia without the least disturbance of their equilibrium."

While not countenancing the practice of dismissing patients with aching eyes, after casual examination, as cases of conjunctivitis because the eyes are red and watery, when a careful examination of refraction would show that glasses are needed, the writer maintains that in many instances glasses are prescribed when the patient's symptoms are not caused by ametropia but are due to unnoticed pathologic conditions of conjunctiva.

"The prevailing method of examining the conjunctiva is first to expose the conjunctiva of the lower lid by drawing it down and away from the eyeball and then to evert the upper lid to inspect its conjunctival surface. If the conjunctiva thus exposed appears normal, the examiner comes to the conclusion that, nothing being wrong with the lids, the discomfort of the patient in near work must be due to the present error of refraction and that glasses must be prescribed. But does the simple eversion of the upper lid expose the whole expanse of conjunctiva? Or does it not conceal from our view the retrotarsal fold? And is not this fold sometimes the seat of marked pathologic changes while the palpebral conjunctiva may present a normal condition? The examination of the lids, therefore, cannot be said to be complete unless it includes the inspection of the retrotarsal folds of the upper lids; and they can be exposed to our view very easily by the following procedure: While the free border of the inverted upper lid is firmly pressed by the thumb or index finger of the left hand against the supraorbital margin, the forefinger of the right hand placed upon the lower lid pushes the latter upward until it pretty well covers the cornea, when a gentle but steady pressure is made upon the globe as if to push it backward into the orbit; a slight back pressure of this kind is sufficient to make the retrotarsal fold come down from behind the everted lid. The whole manipulation is easy and gentle, harmless and painless, and can safely be used except in cases of deep and extensive corneal ulcers."

"Another class of patients who are not infrequently the victims of superfluous glasses are the sufferers of blepharitis. This inflammation of the lid margins, no matter how slight, is always attended by more or less hyperemia of the conjunctiva, and owing to this hyperemia blepharitic eyes are exceedingly sensitive and irritable, easily disposed to become red, watery and painful. These symptoms are particularly likely to develop during prolonged near work, so that blepharitic persons applying themselves to close work (bookkeepers, stenographers, students, seamstresses) are usually complaining of blurring of vision, painful eyes, and often even of headache. In many of these cases the scales along the lid borders are like fine dust and easily overlooked; the patient's complaints are taken for accommodative asthenopia and treated with glasses. Now, if such persons have faithfully used their glasses for a year or two without benefit; if then they are relieved of their complaints in a week or two by the proper treatment of the blepharitis and thereafter continue their work with perfect comfort though they do not use glasses, we are forced to the conclusion that the glasses were unnecessary."

The writer next dilates upon the relation of ametropia to blepharitis. It is well known that an existing blepharitis may be aggravated and its treatment rendered unsatisfactory by uncorrected ametropia, but no one can correctly claim either that ametropia causes this affection or that proper glasses alone will cure it. He does not wish to be considered as regarding the correction of the low degrees of ametropia superfluous under all circumstances, being convinced that weak lenses have their sphere of usefulness as shown by a quotation from a paper written in 1894 in their defense: "The degree of ametropia does not constitute the principal condition in the production of distressing symptoms, and experience does not sustain the statement that hypermetropia or astigmatism less than O. 75 D. seldom causes discomfort or headaches. The state of health, the condition of the nervous system, the occupation are very important factors, and frequently account for the fact that in many persons a slight hypermetropia or astigmatism causes great distress, while other persons never experience the slightest discomfort from the

same ametropia in kind and degree, notwithstanding steady use of the eyes.

Many eyes can endure a great amount of strain with impunity, while other eyes are so constituted that their powers of endurance are quickly exhausted. One person may need glasses for the correction of a small amount of ametropia, while in another person the correction of a much higher degree is not necessary, and glasses would be superfluous. We cannot draw the line at a certain amount of ametropia; but should correct it, no matter how slight in degree, whenever it leads to disturbances for which eye strain constitutes a frequent cause."

Epicritic Remarks upon the Methods for Estimating the Economic Damages from Accidental Eye Injuries.

WÜRDEMANN, H. V., Milwaukee. (*Amer. Jour. Ophth.*, Sept., 1902.) The author refers to the work of Prof. Magnus, of Breslau, Germany, and his own essays upon Visual Economics, and takes up the following propositions:

Earning ability is economically synonymous with visual earning ability for the majority of trades and professions. Injury to vision generally necessitates loss of earning powers. The economic value of vision is equivalent to the wages of the individual. After injuries involving loss of earning ability, the loss of wages may be reckoned from experience in examining large numbers of individuals, or the probable loss in any given case may be found by reckoning the percentage of damage to the normal function and applying this to the calculation of the probable pecuniary loss. A mathematical formula may be made for this purpose, in which the several factors comprising vision should be properly related, and this formula for working vision should be modified by the ability to use the eyes for gainful purposes; the whole forming a formula for the earning ability. By this means a percentage of the loss to the earning ability may be figured and this percentage applied to the probable wages and duration of working life in the individual who has received the accident. Damages to ambition, to hopes and plans, cannot be considered. We must deal with the station in life and expectation of wages and life which belongs to the individual at the time of the accident. Compensation for injuries from accidents to the eyes should be based upon the

economic damage modified by the present rulings of American courts in allowing an empiric amount for pain, suffering and mental anguish, and for philanthropic or punitive purposes or for contributory negligence; the latter amounts being only of forensic importance. By the rules of Magnus and Würdemann the economic damage may be calculated in a fair and just manner to all interested parties.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

BY

J. GUTTMANN, M. D.

NEW YORK.

(Quarter ending September 30, 1902.)

The Papilla and Its Surroundings in a Glaucomatous Eye.

FRIM, DR. ARTHUR. (*Szemeszet*, No. 4.) The author examined 25 glaucomatous eyes which, clinically, were of a different type: 7 cases of primary glaucoma, 4 of those were in a state of degeneration; 18 cases of secondary glaucoma, of which the primary affection was in 2 cases sarcoma intraoculare, in 1 case he found cataracta traumatica and iridocyclitis, in 1 case chorioiditis, in 1 case a luxated cataract, in 8 cases anterior synechia, in 3 cases staphyloma corneæ and in 2 cases iritis and iridocyclitis.

The microscopical examination showed that the changes to be noted in the interior of the eye in glaucoma are all identical.

The sclera was mostly tense in ectatic eyes; it was thinner in the region of the papilla and, on that account, its lamellous structure was more apparent. Two of the cases showed pigmentation. In senile eyes the sclera was rigid sclerotic, the blood vessels showed endartheritis and narrowed lumen; in inflammatory glaucoma there was periphlebitis.

The changes in the chorioidea varied considerably, but there always existed a certain variable amount of atrophy. In 10 cases the chorioidea was detached from the sclera, in 3 cases it was adherent to the sclera. The detachment may be either total or partial; it is usually combined with some tearing of the lamina fusca.

If chorioiditis did not precede the glaucoma, then the chorioidea was found thinner, its structure atrophied, so that the surface appeared uneven and serrated. There

were always traces of a chronic inflammation or infiltration around the blood vessels. The blood vessels showed endo- and periplebitis; often there were obliterations of the capillaries of the chorioidea. The chorioideal pigment is scattered and forms smaller and larger groups. In inflammatory glaucoma the blood vessels are dilated and filled with blood; thrombosis or hemorrhages in the chorioidea is to be found only in hemorrhagic glaucoma or in cases of intraocular hemorrhage. The chorioideal ring is narrower than the scleral ring, the chorioid is thin and atrophied.

The retina was detached in 22 cases. In a great number of those cases the detachment must be considered as artificial. The detachment of the retina, as well as that of the chorioidea, must be considered as a symptom of degeneration. The retina is atrophied, its structure macerated, especially in the ganglion layer, which is chiefly affected. This layer degenerates and disappears, only few homogenous cells without nucleus remain. The layer of rods and cones, the inner fibrous stratum and the outer molecular stratum are similarly affected. The inner limiting layer was thickened in three cases, the outer in one case. The retina may be infiltrated by round cells and may contain hemorrhages. The numerous variously sized and formed cysts in the retina were the most characteristic; they were found in 16 cases; the retina is thickened by their presence, so that these cysts are true symptoms of degeneration. The blood vessels showed endarteritis; their lumen was narrowed or obliterated. The most interesting cases are observed in the papilla.

With the exception of two cases of secondary glaucoma, the papilla was always found to be excavated. In 2 cases there only two-thirds of the papilla was excavated. In 3 cases the excavation was shallow, while in the other cases the excavation was quite deep.

In old cases of glaucoma and in the stage of degeneration the excavation was deep, but in most of the cases it was broad and funnel-shaped. In some of the cases the papilla had entirely disappeared and only on the side of the excavation could be seen a few atrophic nerve fibres pressed together. In most cases atrophied nerve fibres could be found. The lamina cribrosa was always

pushed backward and concave, in form of an arch, the most posterior part of which could reach beyond the thickness of the sclera. The excavation depends upon the lamina cribrosa as the papilla follows its curvature.

The optic nerve was atrophied in every case. In those cases where the atrophy of the nerve was not complete, at least a third of the fibres were found atrophied. The connective tissue was increased, sometimes somewhat infiltrated with round cells. In 5 cases there were cavities, cysts without walls. In one case the vitreous perforated the lamina and entered into the optic nerve (hernia corporis vitrei), the blood vessels were numerous and sclerotic and their lumen diminished. The sheaths of the optic nerve were loose, the intravaginal space mostly normal, in 3 cases ectatic. The posterior ciliary blood vessels were mostly enlarged and endarteritic. The ciliary nerves showed in 7 cases partial atrophy, in the other 18 cases they were normal. The author tries to explain all these phenomena by the secondary sequela of the increased intraocular tension.

Differential Diagnosis Between Glioma and Pseudoglioma.

FEJER, DR. JULIUS. (*Pester Medicinisch-Chirurgische Presse*, July 29, 1902.) Cases of glioma or pseudoglioma are comparatively rare. According to statistics, glioma is found in .004 to .005 per cent. Statistics about pseudoglioma are not known.

In the development of glioma retinæ, 4 stages are to be distinguished, but only the first stage gives us any difficulty in the differential analysis.

Cases which lead to a mistaken diagnosis can be divided in two groups:

(1) Kryptoglioma, where the tumor cannot be diagnosticated an account of the accompanied conditions.

(2) In pseudoglioma, where there are other inflammatory changes in the inner coats of the eyeball and glioma is suspected.

To this group belong detachment of the retina, sarcoma, and tuberculoma of the chorioidea. We understand under the term pseudoglioma a chronic inflammation of the chorioida or of the corpus ciliare by which a yellow reflex appears as in glioma and by which the eye becomes blind. The inflammatory product becomes organized in the vitre-

ous and causes a detachment of the retina. Purulent inflammations of the vitreous, cysticercus, opacities of the vitreous, which become solidified can also give occasion to a false diagnosis.

The author now cites a case which he had observed for a year and a half in which at the beginning no positive diagnosis could be made and only the further development disclosed the true nature of the disease.

A four-year-old child became blind in the left eye and a yellow reflex appeared which was visible in 2 m. distance. The retina was detached and floating in several places. There were in the upper part of the fundus atrophic spots of the size of a papilla surrounded with a dark margin. The eye was without any inflammation, tension normal. With the right eye the child could distinguish subjects in 4 m. distance, and the entire fundus was full of smaller and larger atrophic spots which extended in the retina as well as in the chorioidea. The differential diagnosis was very difficult to make as it had to be considered whether the change in both eyes did not have the same cause, i. e., whether the tumor in the left eye was not due to chorioretinitis. After three weeks there developed lacrimation, there was photophobia and the tension became increased, but without pain. These symptoms pointed to glioma. A year and a half after the first onset the reflex became paler, the tumor became atrophied and smaller. The diagnosis was therefore chorioretinitis which in the left eye was combined with exudation and partial detachment of the retina.

Otitis Media, Complicated by Paralysis of the Eye Muscles.

TOROK, BELA. (*Pester Med. Chirurg. Presse*, May 11, 1902.) In a case of acute otitis media the drum membrane burst spontaneously eight days after the onset of the first symptom. Five days later exacerbation of the pains and severe headache were noted. Later on dizziness and vomiting. One week later vision became dim, diplopia and paralysis of the left abducen were noted. The eye was otherwise normal. The drum membrane was again opened and hot applications applied. The headache and earache subsided and a profuse purulent discharge set in. The diplopia diminished, and the paralysis of the abducens improved.

There are very few cases recorded in literature where an acute otitis without intracranial complications should be accompanied by paralysis of the ocular muscles. In this case there were no intracranial symptoms. The symptoms of vomiting and dizziness in cases of acute otitis with retention must be considered as signifying some affection of the labyrinth. Syphilis, tabes and hysteria could be excluded in this case. The author thinks that the inflammation by some extracranial way found its way to the abducens which is situated near the apex of the pyramidal bone and thus caused the paralysis. Reflex paralysis might also be taken into consideration.

The Diagnostic Importance of Anisocoria.

NAXERA DR. L. (*Wiener Medic. Wochenschrift*, May 3, 1902.) Difference in the size of the pupils (anisocoria) does not always indicate some serious lesion of the central nervous system although in a few cases such might be the case. Such a difference in the size of pupil might be functional or physiological in nature. The author examined the pupils in 500 cases and he fouund anisocoria in 88 cases=17.6 per cent. In 15 cases there was an organic lesion of the nervous system, whereas in 73 cases the anisocoria was either functional or physiological in nature.

The General Importance of Retrobulbar Neuritis.

DEYL PROF. J. (*Wiener Medic. Wochenschrift*, May 3, 1902.) The central negative scotoma is the most important diagnostic symptom of retrobulbar neuritis. It is produced by affection of the temporal fibres of the optical nerve and the prognosis is always good. Tabes, hysteria, and a beginning intracranial tumor must always be excluded in the presence of a central negative scotoma. The author cites the following case:

A man, 55 years old, is not able to read well since a few weeks, and he can see better in the evening than at daytime. V.=5/50 in both eyes. Glasses do not improve his vision. The discs are dim, the temporal portion pale. Field of vision is normal. In the center there is a scotoma for green and red, and in the center of this there is an absolute scotoma. Diagnosis: neuritis retrobulbaris. Several surgeons diagnosticated on account of rectal bleeding a carcinoma of the rectum and the neuritis retro-

bulbaris was looked upon as a part of a cachectic neuritis multiplex. By administration of potassium iodide the scotoma disappeared entirely, the vision improved, the rectal bleeding ceased, and after two years the patient is still healthy.

Phlegmon of the Orbit or Thrombosis of the Cavernous Sinus.

BLYSMA, DR. R. (*Med. Chirurg Centralblatt*, April 14, 1902.) A woman 30 years old, was confined of a healthy child. Five days after labor the woman was suddenly taken sick with chills and continued fever (39° C) and severe pain over the right eye, which pain increased on pressure and on motion of the eye. Headache, vomiting and accelerated pulse. There was edema of the lids and conjunctiva. The bulb protruded downward and anteriorly. There was also edema over the mastoid region. Vision was lost entirely. The papilla was hazy, the arteries thin and the veins enlarged—no hemorrhage. Olfactory and oculomotor nerves normal. No tinnitus, no earache, hearing and drum membrane normal. It was difficult to differentiate between a phlegmon of the orbit and thrombosis of the cavernous sinus. The edema over the mastoid region spoke for a sinus thrombosis, but sinus thrombosis is usually bilateral. In this case it was unilateral, and the cerebral symptoms were comparatively slight. The changes in the bulbus, the protruding eye bulb downward and forward and the pain on palpitation all pointed to an abscess in the upper part of the orbit. As the patient refused an incision, hot applications were applied, and after 36 hours the abscess opened spontaneously. The life of the patient was saved, but the optic nerve remained atrophied.

Treatment of Trachoma by Means of Cupraitrol and Itrol Crede

ARLT, DR. F. R. V. (*Wiener Klinische Wochenschrift*, May 1, 1902.) The writer instils a drop of cupraitrol into the conjunctival sac and then massages the lid. The physician applies the cupraitrol in the morning, whereas in the evening either the patient himself or the nurse makes the application.

In the presence of numerous or large granules he uses a 10 per cent. salve t. i. d. If this is not well tolerated he employs a 5 per cent. salve only twice daily. If the

granules disappear and the mucous membrane becomes smooth he uses a 5 per cent. salve once or twice daily.

In cases where cupraitrol is not well tolerated it is better to apply itrol Credé for several weeks on the everted lid and after that cupraitrol will be better tolerated.

Itrol is very useful especially in cases which are complicated with conjunctivitis lymphatica. It is, however, very sensitive to light and deteriorates very quickly upon exposure to light which contains acetylene.

Itrol quickly diminishes, (often within 24 hours) the secretion in trachomatous, catarrhal and lymphatic conjunctivitis. In blenorrhea neonatorum he cleans off the purulent secretion and then applies the itrol powder twice daily. The duration of the treatment is 6 to 12 days, in which time a cure is usually effected.

Lactoneuritis.

Bondi, Dr. M. (*Wiener Med. Presse*, April 13, 1902.) The patient, a nursing woman, 26 years old, had for the last two weeks complained of loss of vision, which was complete in the right eye and only partial for the left eye. In these two weeks she had also suffered with severe headache and orbital pain. She had had two children, the youngest being 7 months old. She started to wean the child last week and since then she noticed a slight improvement in the left eye. The opthalmoscope showed a distinct papilitis, but there was no hemorrhage nor exudate in the interior of the eye. She was ordered to stop the breast entirely and was given K. I. internally. Five weeks after the first examination she was discharged as cured. Her vision returned completely and the papilla again became normal.

The author then cites several cases found in literature. In most of the published cases both eyes were affected. In one case of Nettleship the trouble began as early as one week before labor. In another case reported by Ragman the eye trouble was complicated by paralysis of the facial and abduceus nerves.

In conclusion, the author states: (1) It is positive that during lactation partial or even total losss of vision can occur. (2) The disturbance of vision is caused by inflammation of the optic nerve. (3) Prognosis of such neuritis

is usually very good. (4) Treatment: Interrupt the lactation and improve the constitution generally.

A Case of Acute Inflammation of the Lacrimal Gland.

BONDI, DR. M. (*Wiener Med. Presse*, April 13, 1902.) The patient, a glazier, 41 years old, complained of pain in the right eye, especialy near the outer canthus and outer part of the upper lid. He thought he had a foreign body in the eye. Both the upper and lower lid appeared tense to the finger. Lacrimation was increased. Examination showed the right half of face to be swollen, and there was a diffused swelling of the upper lid, most marked in its outer third. The lower lid was also somewhat swollen. The margin of the orbit was very sensitive to pressure, the bulbar conjunctiva was swollen and chemotic. Protruding from below the right upper lid was a tumor lobular in structure and of the size of a pea. The tumor was longitudinal in shape and about 8 mm. long. Below this tumor was a secondary mass, similar in structure, 4 mm. long, and also red and inflamed.

Diagnosis—Acute dacrioadenitis, complicated by inflammation of the secondary lacrimal gland.

Treatment—Hot applications. Ten days afterward the patient was entirely cured and all the symptoms had disappeared. This case seems to be especially interesting because the accessory lacrimal gland was also involved, and on account of the prolapse of the gland.

In many of the similar cases cited in literature the affection of the lacrimal gland was accompanied by swelling of the various other glands in the vicinity, e. g., maxillary, buccal and sublingual glands. Hirschberg calls the affection "mumps of the lacrimal gland." Some authors consider this affection as infectious in nature. Pickari has often seen it after influenza. Others have found it in rheumatic, syphilitic and in tuberculous patients. In most of the published cases the affection was bilateral.

Marantic Amblyopia and Asthenopia.

BAHRINGER, KLEIN S. (*Wiener Med. Wochenschrift*, May 10, 1902.) The author defines senile amblyopia and distinguishes it from marantic amblyopia and asthenopia, and he then describes the disease which he styles marantic amblyopia and asthenopia.

The cases which he wishes to class under this name

show a normal fundus. This vision is decreased to one-third or even to one-tenth. One cannot find in these cases any affection of the macula lutea—the so-called Hutchinson's disease, which is so often to be seen in senile amblyopia. Toxic amblyopia can also be excluded in those cases, not only from the history, but also because central scotoma and color blindness are absent. The picture of this disease is characteristic on account of the absence of any pathological changes in the interior of the eye and on account of the decreased power of vision, with no limitation of vision. In other cases the field of vision is normal or only slightly changed from the normal, but the patient complains that the vision is indistinct and poor. He can, as a rule, see quite well at a distance, but his near vision is defective and causes asthenopic complaints. Convex glasses do not, as a rule, improve the sight, and if improvement does take place it is only slight and temporary. The history of the patient always shows that we have to deal with a very sick patient. In nearly all of these cases one can note either a well developed senile marasmus, or marked arterio-sclerosis, or nephritis, or cancer cachexia.

As a rule, this condition shows that the power of vitality is very much diminished, and they usually die from some intercurrent disease within six months.

The author then cites a few cases.

CASE 1. Patient is 88 years old and very marantic. One year ago he was successfully operated on for cataract of left eye. Since two to three weeks visual power of that eye is very poor. The right eye also shows a mature cataract. The left eye shows the usual symptoms of aphakia, the vitreous is clear, The fundus is absolutely clear, in the macula lutea portion as well as in its periphery. There is no detachment of the retina and no hemorrhages. Notwithstanding that, the patient, who a few weeks ago could use the eye perfectly, can do no more than count fingers (with the aid of his glasses) at a distance of 3 metres. Diagnosis: Ambyopia marantica. The patient died within two months.

CASE 2. A widow 67 years old complains of poor vision for both far and near vision. Her power of vision is only R O. 6 L O. 8, Hypermetropia 1 D. Notwithstanding her fairly good vision for distance by means of

+ 4. D., which proved the best glass for her, she could read only 4 J. A stronger glass than + 4 she could not use at all and weaker glasses caused asthenopia. Field of vision and sense of color normal. Ophthalmoscope shows a normal fundus. She was suffering from a high degree of arterial sclerosis. The author made a bad prognosis quo ad vitam. She lived only three months.

The author cites a few more similar cases and then notes the following facts: That in all of his cases there was a far advanced physical marasmus, old age, or organic degeneration. Good vision for distance, but poor vision for near by. Asthenopia and no pathological condition to be found in the eye. He considers the condition as caused by a lessened power of vitality and makes a poor prognosis as to life, death being caused by some intercurrent disease.

ABSTRACTS FROM JAPANESE OPHTHALMIC LITERATURE.

BY

Dr. Mitsiyasu Inouye.

OKAYAMA, JAPAN.

Translated from German Ms. by Nelson M. Black, M. D.

(Quarter ending June 30, 1902.)

Two Cases of Acute Pemphigus.

Komoto, Prof. J. (*Nihon-Gankwa-Gakkwai-Zassi*, B. VI, No. 4.) The cases occurred in a man and woman aged 24 and 22 respectively. The symptoms were ushered in with chills and fever, red macular eruption over the entire body and on the mucous membrane of the nose, mouth and throat; with this appeared a profuse secretion of yellowish saliva and pus from the mouth and nose. Dysphasia, cough and expectoration; hoarseness, painful urination and constipation. Photophobia was of so high a grade the patients could not open the eyes. The eruption changed soon into water blisters which at first varied from size of the finger tip to the size of a bean, increased in size then burst and after some three weeks scabbed over and healed. The fever, which at the begining was 40°-41°, gradually diminished and became normal in two and four weeks respectively. During the convalescence the hair fell out profusely and the nails were lost to be replaced by new ones. The ophthalmological examination by the author took place the following year. Brown spots were in the first case over the entire body; a growing together of the lips at the corners of the mouth; conjunctiva bulbi injected; conjunctiva of the lids are partly scarred, part of the epithelium lost and showing granulation spots covered with a dirty gray membrane. Symblepharon is in the formation stage and the secretion purulent.

The important condition found in the second case was the

continued secretion of the eyes; while the tarsal conjunctiva of the upper lid was greatly scarred, the lower shows granulation tissue except a narrow zone along the lid edge of regenerative epithelium. Brown pigmented spots over the entire body were found similar to the first case.

A Rare Case of Syphilitic Affection of the Tarsal Conjunctiva.

IYESAKA, S. (*Tokio-Iji-Shinsi*, N. 1252.) A 30 year old man consulted Iyesaka in December, 1898, with the complaint that his eyelids had been swollen for forty days; the swelling was hard to the touch; the conjunctiva was diffusely swollen and especially so that of the lower lid; no folicules; secretion almost none; symptoms of secondary syphilis on the body. After one month of inunctions, the and lid and conjunctival swelling nearly disappeard; microscopical examination of a portion of the tissue showed numerous capillaries and profuse cell infiltration.

Two Cases of Distoma Cyst of the Orbit and Lid Respectively

WAKABAYASHI, T. (*Tokio-Iji-Shinsi*, N. 1250.) Dr. N. Tanigutsi was the first in Japan to report a case of distoma-cyst of the orbit. Prof. H. Miyake followed with a similar case and the author now adds the following cases:

In the first case, a 3 year old girl, in the summer of 1900 a tumor was noticed on the right upper lid which gradually increased in size without causing either redness or pain; neither coughing nor vomiting caused any change in the general appearances. When first seen in September of the same year, W. found a half-round swelling which occupied nearly the entire upper lid of the right eye showing a smooth surface. There was high grade ectropion of the lids. The upward movement of the eyeball was interfered with. The tumor was elastic, soft, and partly growing in with its surrounding tissues but not adherent to the skin. In the extirpation of the tumor, the wall was unintentionally broken and the gray semi-fluid contents, containing oval foreign bodies hardly the size of rice corns escaped. Close observation showed the foreign bodies to be distoma which in comparison with a common lung distoma were far smaller, the eggs were neither contained in the cyst contents nor in the connective tissues nor in the stomach of the animal itself, the species can not be definitely indicated. The author thinks perhaps it was a lung distoma.

The second case, a 17 year old boy, noticed in Sept.,

1900, first a dimness of vision and a swelling of the left upper lid which increased gradually; then appeared diplopia and pain in the upper part of the orbit. In October of the following year a hard tumor developed in the left lid under the eyebrow. Occasionlly the patient would expectorate a dark brown substance in which on microsopical examination were found numerous lung distoma and Charcot-Leyden crystals. Present condition, the bulb was pushed forward, a tumor in left upper lid not adherent to the overlying skin; the vertical movements of the eyeball were interfered with; fundus normal; puncture of the tumor showed its contents to be a grayish yellowish green substance, the microscopic examination of which showed it to contain numerous lung distoma eggs and Charcot-Leyden crystal. The tumor was composed of two cyst divided by an uncomplete septum. The day following the operation on redressing the case the author noticed a part of the cyst wall remained and on probing a mother animal and a yellowish green mass were removed. The cyst wall was composed of two layers of tissue, an inner of delicate yellowish red and an outer of some what tougher light red.

Cauterization of the Eye with Old Ink.

EBIHARA, S. (*Nihon-Gankwa-Gakkwai-Zassi*, B.VI, N. 5.) A 9 year old boy in playing spilled some thick old ink in his eye, afraid of becoming blind he sought the author. The examination showed the cornea and conjunctiva a deep dark blue color and very dry; the conjuctiva of the lower lid being more deeply colored than the upper; much washing did not change the condition. A cauterized spot was seen at the inner canthus; the cornea was so opaque that the pupil could hardly be seen with oblique light and showed a ring formed ulcer. Treatment was atropine, vaseline, bandage and hot boric compresses. At the second consultation on the fourth day, the author was surprised to find the color had fully disappeared and the eye seemed normal excepting a slight coloring at the inner canthus and a beginning symblepharon of the lower lid.

A New Conjunctival Suture in Cataract Operation.

KOMOTO, J. (*Ibidem*). The author suggest that in certain cases of cataract extraction where the vitreous may escape the following method: Make a long conjunctival flap and then pass through the insertion of the superior rectus muscle

a thread with twc needles, these are to be passed through the conjunctval flap and as soon as the lens is extracted tied. This procedure is suggested in the following conditions: (a) dislocated lens, (b) aqueous vitreous, (c) and when conditions indicate, the lens must be extracted in the capsule.

A Case of Contracted Visual Field in Cirrhosis of the Liver.

INOUYE, MITSIYASU. (*Okayama-Igakukwai-Zassi*, N. 149.) This visual field anomaly discovered by Weiss in 1882 seems to be not generally known. The following casual report may be of interest:

A 44 year old laborer complained of loss of vision and yellow vision of 4 months' duration. V. in each eye 6/VIII; V. F. particularly the right greatly contracted; light sense somewhat lowered, yellowish scleral conjunctiva without epithelial xerosis; fundus and media normal. Patient was well nourished but slightly anemic. The well developed abdominal wall and existing acetes prevented an exact determination of the boundaries of the liver and spleen but no enlargement of these organs could be found. Jaundice of the skin not marked; yellowish brown feces; urine free from albumen and bile pigments. The author recognized alcoholic cirrhosis of the liver as the cause of ophthalmic changes and exhibited internally diuretics with rapid improvement in the eye symptoms and ascities.

Concerning the genesis of hepatic ophthalmia, the author concludes it is a blood dyscrasia as the man was well nourished.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas City, Mo.)

Dr. Circincione has been made professor of ophthalmology at Sienna.

The German Ophthalmological Society held its annual meeting August 4-6, 1902.

Dr. Alfred Graefe, the well known ophthalmologist, died September 1, at Innsbruck.

Dr. T. A. Woodruff has been appointed ophthalmologist to the Baptist Hospital, Chicago.

Dr. Johann Deyl was recently made professor of ophthalmology in the University at Prague.

Dr. E. L. Oatman has been appointed a surgeon in the ophthalmic department at the Manhattan Eye and Ear Hospital.

Dr. N. C. Jones has received an appointment in the Ophthalmological Department of the Royal Victoria Hospital, Montreal.

That distinguished ophthalmologist, the Archduke Carl Theodore of Bavaria, has performed his four thousandth operation for cataract.

Dr. C. R. Holmes, of Cincinnati, was elected Third Vice-President of the American Medical Association, at the meeting at Saratoga.

Dr. Theodore A. Christen, of Cincinnati, has been appointed to the Chair of Ophthalmology in the Cincinnati College of Medicine and Surgery.

Dr. James Barcley, Jr., has been elected clinical professor of diseases of the eye and ear in the Woman's Medical College, of Baltimore, vice Dr. Herbert Harlan resigned.

Chicago Eye, Ear, Nose and Throat College.—Dr. T. A. Woodruff, editorial secretary of the Ophthalmic Record, has been elected Professor of Ophthalmology; Dr. Harold N. Moyer has been appointed to the chair of Neurology; Dr. E. J. Gardiner has received the appointment of Professor of Ophthalmology.

One of the thirteen addresses before the General Session of the International Medical Congress, Madrid, April 23-30, 1903, will be

delivered by Santos Fernandez, of Havana, Cuba, his subject being "Eye Diseases in a Tropical Country."

Every railroad in the United States has been furnished with an official report of the recommendations made by the Ophthalmic Section of the American Medical Association for the examination of the eyes and ears of railroad employees.

Eye Hospital in Need.—Wills Eye Hospital is much in need of funds. A citizen of Philadelphia, whose identity is not made public, offers to give $15,000 for the endowment of the institution provided that $100,000 shall be subscribed by Jan. 1, 1903.

The Chicago Eye, Ear, Nose and Throat Hospital has recently equipped its building with a steel fire-escape of the stairway pattern, which is also connected by steel balconies with each sleeping room in the building.—Jour. Amer. Med. Assn.

Assistance for the Blind of New York City.—During September the municipality distributed its annual donation through the Department of Charity. Each blind person who was declared worthy and needy received $50 in gold, nearly 1,000 persons being benefited.—Amer. Med.

Decrease of Blindness.—Statistics indicate that the proportion of blind to seeing persons in Great Britain, during the last fifty years, fallen from 1,020 to 870 in the million, a decrease of more than 14 per cent. This is ascribed to better conditions of living, improved surgery and the lessening of perilous employments.—Amer. Med.

Eserine in the Treatment of Corneal Affections.—R. A. Katz, St. Petersburg (La Semaine Medicale, April 23, 1902) finds that eserine exercises a favorable influence on keratitis without abscess and particularly in peripheral infiltration of the cornea. He employs a pomade containing .03 ctgr. of eserine to each 6 or 8 grams of excipient.—Amer. Med.

An address was delivered by Dr. Alvin A. Hubbell, of Buffalo, before the Ophthalmic Section of the Fifty-third Annual Meeting of the American Medical Association, entitled "Jacques Daviel and the Beginnings of the Modern Operation of Extraction of Cataract" and was commemorative of the third semi-centennial anniversary of the publication of the first description of the operation.

Ophthalmia in Schools.—The Board of Health in New York City having declared that ophthalmia is a contagious disease, especially prevalent among school children, Commissioner Lederle has appointed eleven physicians to visit the various public schools, examine the children, and report each case to the board. The pay of these gentlemen is to be at the rate of $100 per month, and they will make daily visits to the schools.

The result of Dr. Richard Derby's personal investigation as to eye diseases in the schools of New York City shows how real the

danger is. Of the two thousand pupils subject to examination 20 per cent. proved to be suffering from contagious eye diseases and more than one-fourth of these of so serious a nature that cure of the condition could only be hoped for by operation.

Eye Specialists for the Public Schools.—Ophthalmic Surgeons will be regularly employed in the New York public schools this fall. The Health Commissioner of the city of New York, from the examination of 55,000 children in 36 schools last year, found no less than 12 per cent. afflicted with contagious disease of the eye. It is to prevent the attendance of such children that a routine examination of the eyes is to be made regularly in the future.—Phila. Med. Journal.

Index of Ophthalmic Literature.—The Ophthalmic Review, at the close of the present year, will publish an index for its last fourteen volumes, from 1889, to 1902 inclusive. This will embrace both its original articles and its reviews of current literature. This will make it a useful index of the ophthalmic literature of the period. It can be obtained by any one, by sending two shillings, sixpence, to J. & A. Churchill, London, before December 31, 1902.

The Denver and Gross College of Medicine.—This institution, formed, by the union of the two medical schools heretofore existing in Denver, starts with a strong department in Ophthalmology. Dr. E. C. Rivers, for many years the Professor of Ophthalmology in the Denver school, is President of the Board of Trustees of the new institution; and Professors Melville Black, D. H. Coover, and W. C. Bane, will also take part in the teaching of this branch.

Ophthalmology at Oxford.—Mrs. Margaret Ogilvie has established a fund which will yield at least £200 yearly for the maintainence of a readership in ophthalmology at Oxford University. The reader is to deliver 12 lectures yearly, 6 of which may be clinical, and is to conduct original research upon the pathology and therapy of diseases of the eye. He must be honorary surgeon to the Oxford Eye Hospital. The first holder of the readership is Robert Walter Doyne, who has already distinguished himself in research work.—New York Med. Record.

Shorthand System for the Blind.—At a recent meeting in the interests of the blind held in the Church House of London, a blind stenographer, by the aid of a recently invented machine, took a verbatim report of each of the speeches. The system is the outcome of a prize offered two years ago by a Braille magazine and is built upon several systems adapted to the Braille method of dots. These dots are embossed by the machine, which is noiseless, upon paper tape. This flows into a basket, to be read back by the fingers of the stenographer and recorded on a typewriter.—Amer. Med.

Leidy, in Amer. Med., says: In congestive conditions of the eye of gouty origin with pain and tenderness, I have found prompt relief not only from pain, but almost instant clearing of the conjunc-

tiva and associated vascular system, the congested eye clearing and appearing almost normal, from the instillation of 2 to 3 gtts. of the following:

℞. Formalin 005
Cocain hydroch. 1
Aq. destil. 10

—Jour. Amer. Med. Assn.

Visual Hygiene in the Public Schools.—The time has surely come when it should be demanded of the State that adequate and scientific hygiene must be provided if school attendance is made compulsory. Those who have in general terms advocated this have often shrunk from definite and detailed description of what this means for fear of the change of self-seeking and self-advertising. We must conquer such squeamishness, because as we progress (or regress?) there is more danger from the great machine which with "grind" and "cramming" too often endangers the health and vision of the children. In every state the law should command that thoroughgoing testing of the eyes of every pupil should be assured by a competent refractionist, either supplied by the parents or furnished by the school authorities. The majority of young eyes are hyperopic and astigmatic, and lifelong harm may follow their use at a tender age without spectacles. There is an error all too prevalent already that eye-strain means overuse of a normal (or approximately normal eye, whereas the term means the result of the use of an ametropic eye. A vast deal of the ill-health and bad results charged generally to schooling and overcrowding, such as anorexia, nervousness, denutrition, headache, etc., are solely due to ametropia, which itself is not a disease (except in high myopia) but which with use of the eyes speedily begets disease.—Amer. Med.

Ametropia in Kindergarten Children.—The eyes of the little child are almost always hyperopic and astigmatic and the ocular tissues are especially plastic and easily injured by near work such as is common in kindergarten schools. It therefore behooves all teachers of these schools and parents who send their children to them to see to it that the eyes of every child be tested by an expert oculist. Dr. Newsholme, of England, has especially directed attention to the danger of injury to the eye at this time of life, but with many others he fails to point out the true remedy. It is not so much the postponement of attendance at school until later years, when the eye shall have supposably become more capable of resisting strain; this should be done, of course, if there were no other remedy. But there is another remedy, viz., spectacles, if needed; and with this remedy applied there is obviated all the disaster rightly described. The work of the ordinary kindergarten is not harmful to the eyes or health of little children, provided that the eyes have been tested by a skilled refractionist. If the child of five needs glasses to prevent injury to the eyes and to the health, the chances are that at a later age the double injury will not be avoided except by glasses. All the nonsense about "bespectacled children" and a "beglassed nation" must be contemptuously put down. If

the facts are as stated, pride and prejudice must have no voice in the matter.—Amer. Med.

Accomplishments of the Blind.—It is fast becoming true that, to paraphrase an old saying, in the language of the blind there is no such word as impossible. There is in Philadelphia a blind newspaper dealer who without help conducts a successful business. (And there are good men who go out of their way to buy their papers of him!) But the veteran blind newsdealer, Marcellus Betz, has just died in New York from a fall while serving papers on his route. He lost his eyes in 1860. He was 71 years of age and had been selling papers since he was 8 years old. In Berkeley, Cal., there is a young woman of 18 who can do most anything that others do—except to see. She will be graduated next year at the usual age from the high school. Besides all the usual accomplishments of the blind she is a good musician, reading the raised notes for the blind; she is a good seamstress; she not only uses the typewriter for the blind, but the ordinary one, taking down rapidly from dictation; she plays whist with interest and skill, by means of pin pricks in the corners of the cards which she understands, touching each card as played by the others, and then promptly playing her own. She is an expert bicycle rider and has made her "century run." She rests her left hand in riding on the right hand of her companion and guides the machine with her right hand. We have learned of a man blind, and like Laura Bridgman and Hellen Keller, also deaf and dumb, who traveled alone all over the United States, lived a good and enjoyable life, supported himself and family—all by means of a most ingenious device, the letters of the alphabet tattooed plainly upon the palm and fingers of one hand. By pointing to these letters others soon learned to understand what he "said," and their answers were known to him by the spots or letters they touched upon his hand in reply. And we most fortunate ones bewail our difficulties!—Amer. Med.

Cross-Examination of Expert Witnesses.—The Supreme Court of Idaho says, in the personal injury case McLean and wife vs. the City of Lewistown, that one of the assignments of error went to the right of counsel for the parties suing, on cross-examination of a medical witness, to make out his case by such cross-examination. It appeared that a physician was called as a medical expert on the part of the city, and on cross-examination a long hypothetical question was put to him which had been propounded to medical witnesses of the parties suing, and had been answered by them, and answer of this witness corroborated the evidence of the experts of the parties suing, and served to strengthen it. But the court says that the parties suing did not rely on that cross-examination to make out their case. Under the law a liberal range is allowed in the cross-examination of expert witnesses; and the court does not think that error was committed in said matter. Hypothetical questions, it also holds, must be based on the facts admitted or established by the evidence or both.—Jour. A. M. A.

The True University School and the "Specialties."—In his description of what a real university school shall be, Dr. Barker has dealt with the question of the specialties. He recognizes that the specialist will continue to be a private practitioner. The reason for this difference in status will result from the financial difficulties attending the foundation of a staff that will make each chair a full university position, with an adequate salary. But even here the example of high attainment in certain clinical chairs must react favorably upon specialties. With suitable hospital facilities they, too, can be made to yield important results to the stock of medical knowledge. No one will deny that there is no lack of the "spirit" of research among the specialists; but how many find either the time or the facilities for carrying on systematic investigation? To live in an atmosphere of research is the surest security of undertaking investigation. And the hospitals that are to supply the facilities to other branches must also be made to yield them to the specialists.—Amer. Med.

The Becquerel Rays in Ocular Diagnosis.—The x-rays have come to occupy so prominent a place in medical and surgical diagnosis that it will not prove a source of much surprise to find that the more recent discoveries with regard to the socalled Becquerel rays are just as announced as having a cognate diagnostic application. The Becquerel rays are the radiations emitted at normal temperatures by certain metals. Professor Becquerel first called attention to the fact that various compounds of uranium glowed in the dark and possessed in this regard a property resembling phosphorescence. The metal itself did not, however, lose weight as the result of this emanation of light, and it was found that the light was due to a disturbance of the ether causing light waves but without any of the development of energy usually considered necessary for the production of light. Other metals were found to act the same way, notably certain rare new metals, as polonium and radium, socalled because of its radiant quality. It was discovered that these metals might have an effect upon the skin not unlike that produced by the x-rays in the socalled x-ray burns. Salts of uranium carried in a phial in the pockets have been known to produce redness of the skin followed by desqumation and subsequent soreness that did not heal for several weeks.

Recently M. Curie, of Paris, the discoverer of the new metal radium, has been experimenting with certain possible uses of this metal in ocular diagnosis. It is often of extreme importance to know whether the retina behind opaque ocular media is still capable of responding to stimulation by rays of light—is, in a word, capable of vision if the opacities of the media should be removed by operative procedure. The radiations from radium are said to penetrate absolutely opaque media and demonstrate the sensitiveness of the retinal nerve fibers very clearly. Among others, the distingnished French ophthalmologist, Javal, has been attracted to the study of the subject. Javal is blind as the result of chronic glaucoma, for the cure or amelioration of which every means known

to science was employed in vain. He hoped to find in the new metals and their radiations certain helps for the blind and also some lights on the physiology of vision and the nervous conduction of light. The whole subject is one of those fascinating phases of advancing science that holds out attractive promises of important results. Observations so far made certainly encourage the idea that there may be significant practical improvements for ophthalmology to be derived from the new science of radiology.—Amer. Med.

Examination of Illinois School Children.—Acting upon the suggestion of the Chicago Board of Education, the Illinois State Board of Health has recommended that the school authorities inaugurate a system of examination of the eyes and ears of the school children of the State. The examinations are to be held once yearly by teachers and embrace ten questions of a practical nature which can be answered in five minutes. If a defect is found, the parent is notified by a card of warning. Examinations are made compulsory. —Amer. Med.

Ulcers of the Cornea.—The following treatment of corneal ulcers, taken from Rev. de Ther., is recommended by Galezowski:

℞	Iodoformi	gr. iss	09
	Cocainæ hydrochlor.	gr. i	06
	Petrolati	ʒiiss	10

M. Sig.: Apply locally.

After the ulcer begins to heal and cicatrize, the following ointment should be applied:

℞.	Hydrarg. chloridi mitis	gr. iiss	15
	Dionin	gr. i	06
	Lanolini	ʒiss	10

M. Sig.: Apply locally. —Jour. Amer. Med. Assn.

Blindness Due to Antiseptics.—The surgeons of the New Orleans Eye, Ear, Nose and Throat Hospital have noted the great number of patients entering the institution from the country around New Orleans suffering from partial or total blindness. An investigation has disclosed the fact that a cheap antiseptic, containing a large amount of wood alcohol, has been used throughout Louisiana. The city chemist found as much as 30 per cent. of methyl alcohol in some of these specimens, rendering them totally unfit for internal administration. As methyl alcohol, when taken internally, acts directly on the optic nerve, the majority of the persons affected will not fully recover their eyesight.—Phila. Med. Journal.

Wholesale Importation of Trachoma.—Eighty-five cases of trachoma were found among the steerage passengers of the French line steamship La Gascogne and the Red Star liner Zeeland, which arrived at the port of New York this week. There were sixty-five cases on the former and twenty on the latter. The persons affected are mostly Syrians, Roumanians, and Austrians. The only penalty for such attempted importation at present is deportation at the expense of the lines, but under the proposed new emmigration act,

which has not yet become a law, a large fine may be imposed upon any steamship company bringing diseased passengers to this port. —New York Med. Record.

Boards of health throughout the country should emulate the example of the health board of New York City, that at once recognized the danger to its school children when it was pointed out, immediately undertook a census of the schools as regards the existence of contagious ophthalmia and is ready with the beginning of the school year in September to enforce the hygenic relations that will prevent all risk of further spread of the infection among the children in attendance at the public schools. This should be only a preliminary step to following the disease to the tenement houses where it exists among the adults, and so securing the obliteration of every trace, if possible, of the unwelcome foreign pathologic visitant.—Jour. Amer. Med. Assn.

Progress in Diseases of the Eye and Ear.—Dr. Talbot R. Chambers of Jersey City presented this report. He said that it had been recently claimed, as a result of experimental study, that the fluid in the anterior chamber of the eye comes from the anterior surface of the iris, and that the ciliary body is not a secreting organ. The value of removal of the superior cervical ganglion for glaucoma was receiving very serious consideration, and in the early part of the present year it had been reported that seventy-four cases had been so treated with only one death. It was not indicated in acute glaucoma except when iridectomy was refused or had been done on the other eye, and had not proved successful. A careful investigation as to the effect on surgical instruments of boiling them had demonstrated that there was little liability to rusting if the instruments were boiled in an alkaline solution, preferably one of carbonate of soda, and that the temper would not be injured if the instruments were not directly in contact with the bottom of the vessel. The dulling of knives by wipeing them after boiling was greatly underestimated. With regard to the treatment of cataract it was asserted that the stimulation of the circulation by massage and electricity and heat were methods only possessing theoretical value. The importance of preventing mastoiditis was to be inferred from the fact that the four thousand deaths in this country annually from abscess of the brain were attributed to this cause, and that 50 per cent. of deaf mutes were so afflicted from the same cause, and that 20 per cent. of the pupils in our schools had defective hearing. Lumbar puncture had been recommended as a means of detecting the presence of a complicating meningitis. The presence of meningitis was indicated by the fluid being more or less cloudy.—New York Med. Record.

Treatment of Detachment of the Retina by Injections of Sodium Chloride.—Castresana announces that injections of a concentrated solution of sodium chlorid cure detachment of the retina by the strong osmotic currents and the slight irritation with consequent

adhesion which they induce. Starkle has recently reported 23 cases thus treated, resulting in six complete and 10 partial cures. He used a 4 to 10 per cent. solution which Castresana does not consider sufficiently powerful. He would probably have been still more successful if he had injected a saturated solution of the sodium chlorid such as Castresana recommends. He reports several patients treated in this way with the cure of all the recent cases. Detachment of long standing is incurable. In one patient the detachment had occurred four years previously in one eye and six months in the other. The first eye was not affected, but the detachment was entirely cured in the second eye with restoration of vision. He injects beneath the conjunctiva 2 gm. of a saturated solution of sodium chloride to which two drops of acoïn have been added. The injection is rather painful and causes considerable chemosis for a few hours, with irregular pulse and a tendency to vomit, but all these symptoms passed away in the course of twelve hours and the reaction was very slight to the second injection, which he found necessary in a few cases. No results were noted after the injections in two cases of six and two years' standing. He administers potassum iodide as an indispensible adjuvant to the local treatment. He considers this method of treating detachment of the retina as the most rational at our command. He illustrated the eye before and after treatment in the two perfectly cured patients.—Ophthalmic Record.

Credé's Method of Treating Ophthalmia of the New Born.—G. Leopold enters into a review of the literature, and gives his own experiences with this method of treatment. Cramer has been most pronounced in his condemnation, claiming that the nitrate of silver solution in a large number of instances produces in itself an inflammation of the conjunctiva, which is frequently very serious, often giving rise to incurable sequelæ. A perusal of Cramer's article shows that the technique employed by him is not the same as that recommended by Credé. Cramer, after dropping the silver solution into the internal canthus, opens and closes the eyelids with the fingers a number of times, so as to secure an equal distribution of the fluid. It is certain that in this way much irritation is produced, and if inflammatory lesions arise they are certainly due to the traumatism, rather than to the silver solution. Credé advised that the fluid be dropped directly upon the cornea, and that all manipulation of the eyelids be withheld. If these instructions are carefully followed, abundant experience has shown that subsequent inflammation is of the rarest occurrence. Manifold statistics prove the efficiency of the method as advised by Credé. In all institutions where it is used blenorrheal ophthalmia is to-day a rare disease. Out of 2,146 births which occurred in the author's clinic in 1898, in but three did ophthalmia develop. In all of these a 2 per cent. solution was used. Since the beginning of 1902 a 1 per cent. solution has been exclusively used by the author. Six hundred and ninety-eight births have taken place, and only one case of blenorrheal ophthalmia has occurred. In none of the cases was any

imflammation due to the silver noticeable. In a few there was a slight irritation, which lasted twenty-four hours and disappeared without the necessity of treatment. It has recently been proposed to substitute the acetate for the nitrate of silver in the strength of a 1.24 per cent. solution. This has been tried by the author with satisfactory results, but it cannot be said that it possesses any advantages over the nitrate solution.—New York Med. Record.

Contagious Eye Diseases in This Country.—In a recent article on "Immigration's Menace to the National Health," Mr. T. V. Powderly, Commissioner General of Immigration, called attention to the efforts of the United States authorities to exclude from this country, especially in recent years, such affections as favus and trachoma. There is no doubt that as a consequence of the extensive immigration, particularly from certain parts of Europe, these diseases have become much more frequent in this country than they used to be. Mr. Powderly calls attention to the fact that sometimes political influence is appealed to to secure the admission of immigrants afflicted with this disease, especially if it is in mild form and causing few external symptoms, and that efforts are likely to be made to bring such undesirable additions to our population by other ways than through the usual ports of entry.

Ointment in Blepharitis.—Dr. Raimondo Ferro, according to an abstract taken from Gazz. d. Ospedali, has experimented with a number of remedies in the treatment of blepharitis, during the past few years. He states that local application of solutions of iodin, nitrate of silver and pyoktanin are of no value.

He recommends the following ointment, which has been of great service to him in the treatment of this disease:

℞. Cupri sulphatis
Ichthyol, aa gr. viii
Vaselini albi ℥i 30 | 50

M. Sig.: Cleanse the part and apply locally.

Its use, according to the author, does not affect the cornea or conjunctiva, and so uniform are the results that he considers the ointment as a specific in blepharitis. The ichthyol acts as an antiseptic and a stimulant, while the copper sulphate exerts astringent properties, reducing the congested sebaceous glands of the eyelids. —Jour. Amer. Med. Assn.

Granular Conjunctivitis.—B. Melconian, according to an abstract in Amer. Med., states that an application of a solution of iodine produces more satisfactory results in granular conjunctivitis than any other medication. He recommends the following:

℞. Metallic iodi gr. i
Liq. vaselini ℥i 30 | 06

M Sig.: To be used locally.

The foregoing solution may be modified to suit the case. In acute cases or in young individuals, the quantity of iodine should be reduced one-half. The affected eye should first be cleaned with a ampon dipped in a boric acid solution. The lids should then be

turned and the iodin applied to the granular areas by means of the end of the finger in order that light massage may be given to the lid at the same time. The lid should then be closed for five or ten minutes and protected from dust and strong light. The treatment should be repeated morning and evening and in the middle of the day one or two drops of the solution should be instilled into each eye as a collyrium, which may be followed by light massage over the closed lids. The author states that immediately after the treatment the eyes became red, there is lacrimation and some photophobia. These symptoms disappear in from one-half to an hour, as a rule. In some cases, however, the symptoms persist for several days. In such cases the treatment should be begun with a 1 per cent. ointment of yellow mercuric oxid. This treatment, he states, should be continued for three to six months.—Jour. Amer. Med. Assn.

"Teaching the Blind to See" is the title given articles descriptive of methods of improving the vision of those with high amblyopia. It is curious to prove, as we have done in several instances, that there are more cases of pseudoblindness than one would suspect. It is strange that even a child would exaggerate amblyopia and take interest in seeming more "blind" than it really is. And yet this is sometimes true. When vision is very poor it may prove a difficulty and danger, and renunciation of the attempt to see is found preferable. This may be emphasized, and perhaps usually is, by the desire of parents (and even of the child) to secure its admission to some charitable institution. The term blindness thus has often only a relative significance. If the blindness is absolute, there cannot be such a thing as "making the blind to see." Even in cataract, operation removes the obstacle to vision, permitting the functional retina to have its normal stimulus. It is doubtless true that the sense of vision is capable of great improvement in every person, but it is often surprisingly so in many of the socalled blind. If those with but a slight degree of vision are permitted to renounce the little they have they in fact lessen it, whereas if they try to improve it they may in fact increase it and make it more and more useful. This accords with the general physiologic law that disuse atropies organs and exercise develop them. The Literary Digest, translating from Drout in La Nature (Paris, June 14, 1902), describes the method pursude by M. Heller, a teacher of the blind, near Vienna, in developing and educating the sense of vision in two little boys. In daylight they were apparently completely blind, but the sensation of light could be stimulated in a dark room. M. Heller began by arousing discrimination between light and darkness by the use of brilliantly illuminated discs in a dark room; he then proceeded to the discrimination of form and colors in the same way, until he finally succeeded in making one boy tell objects in ordinary daylight. The plan is an excellent one and would perhaps be similiarly successful in the case of many now supposed hopelessly blind. Those in charge of our institutions for the blind may find M. Heller's suggestion well worth carrying out.—Amer. Med.

During Prof. Haab's visit to chicago he was a guest of Dr. Frank Allport. Monday evening the Chicago Ophthalmological and Otological Society tendered him a reception and banquet at the Wellington Hotel, at which thirty-five physicians sat down to table. The supper was excellent and Dr. Hotz officiated as toast-master for the evening, and was most felicitous in his introductions of the speakers. Prof. Haab responded to a toast most feelingly, saying that he deeply appreciated the courtesy shown him by his American colleagues, and expressing a conviction that ophthalmology should not be a sectional science or one confined to any country or people, but should be international, and that ophthalmologists the world over should feel themselves united as members of one family.

Among those who responded to toasts were Drs. Wilder, Bulson, Moyer, Wood and Allport.

During his visit in Chicago Dr. Haab was the recipient of many courtesies from his American colleagues, and he was shown most points of interest by various members of the profession. He enjoyed his visit to the University of Chicago particularly, expressing unbounded admiration for the institution, saying that he believed it would not be long before European parents will send their sons to this institution for education. One feature of Prof. Haab's visit that greatly interested him was the enormous office buildings where physicians have their offices. He was amazed at the fact that in one Chicago office in the Reliance Building fifty-three physicians transacted business.

Prof. Haab was in Chicago from Sunday afternoon until Wednesday afternoon.

Prof. Haab sailed for New York on the Kronprinz Wilhelm, arriving on Tuesday afternoon, May 27. He was met at the dock by Dr. John E. Weeks, who accompanied him to his hotel, the Waldorf-Astoria. On Wednesday Prof. Haab lunched with Dr. H. Knapp and subsequently enjoyed a drive in Central Park, visiting the Metropolitan Museum of Art. In the evening Prof. Haab, Dr. Jacoby, President German Medical Society, and Drs. Webster, Marple and Weeks were entertained at dinner by Dr. R. Denig at the German Club. On Thursday afternoon Prof. Haab was escorted to the New York Eye and Ear Infirmary, which institution he inspected in the company of Dr. Derby, the Executive Surgeon, and Drs. Callan, Dennet, Weeks and Marple. On Thursday evening Prof. Haab was the guest of the Hospital Graduate's Club, at the Hotel Manhattan, on the occasion of the seventeenth anniversary banquet, Dr. W. E. Lambert presiding. One hundred and fifteen physicians and their friends were present. Toasts were responded to by Rev. Dr. Greer, Dr. Polk, Dr. Newcomb, Prof. Haab, Dr. Delavan and others.

On Friday afternoon Prof. Haab visited the Manhattan Eye and Ear Hospital, where he was entertained by the members of the Surgical Staff. On Friday evening Prof. Haab attended a dinner given in his honor at Delmonico's; this function was arranged by a committee composed of Drs. D. Webster, John E. Weeks and W.

B. Marple. There were twenty-three covers. All in attendance were ophthalmologists. Dr. D. B. St. John Roosa presided as toast master, and was very felicitous in his remarks. Prof. Haab responded to the address of welcome by Dr. Roosa in a few well chosen sentences. The toast, "The Influence of the Work of our Foreign Colleagues on American Ophthalmology," was responded to by Gruening. Dr. L. Howe, of Buffalo, read a poem; Dr. Kipp, of Newark, responded to the toast, "The Acrobatic Influence of the Magnet;" Dr. W. S. Dennett to the toast, "Why the Magnet Sometimes Fails to Work;" Dr. George de Schweinitz, of Philadelphia, "American Ophthalmology." Letters of regret from many ophthalmologists who could not attend were read by the secretary of the committee. On Saturday at 5:30 p. m., Prof. Haab left New York for Chicago on the Lake Shore limited.—Ophthalmic Record.

Rudolf Virchow died September 5 in Berlin. He was born October 13, 1821, at Schufelbein in Pomerania. In 1885 he entered the gymnasium of Köslin, going from there to the Medical Frederic William Institute in Berlin, where he graduated in 1843. In 1844 he was appointed assistant to Professor Floriep, giving courses in pathological anatomy. In 1846 he was prosecutor in the Charité Hospital, and in 1847 he was recognized as privat docent in the University of Berlin. In 1848 he was sent by the government to Upper Silesia to study the "hunger typhus" epidemic which was then raging. Because of his report, in which he drew attention to the downtrodden condition of the peasants and advocated radical changes in their political management, he incurred the displeasure of the government and was deprived of his positions. Afterward he was partially reinstated, this being mainly due to petitions urged by fellow members of the profession. In 1849 Virchow left Berlin to assume the professorship of pathologic anatomy of Würzburg, which position he held until 1856, when he was made professor of pathologic anatomy at Berlin. He was then organizer of the first laboratory devoted to pathology, and this has since been the Mecca for students in all countries. Perhaps Virchow's greatest pride was in the great pathologic museum he established, which, in 1901, contained 20,883 objects with 2,000 more not yet placed. This was open to the public on Sundays from 12 to 2, Virchow and his assistants being present to give information and instruction. In 1847 Virchow founded, with the cooperation of Dr. B. Rheinhardt, his celebrated *Archiv für pathologische Anatomie und Physiologie und für klinische Medicin*, one of the greatest storehouses of facts in scientific medicine ever published.

Beginning his pathologic work in the fifth decade of the last century it was the greatest opportunity of Virchow to be a pupil of Johannes Müller, in whose time, as Virchow himself said later, scientific pathology was still struggling to free itself from the vague mysticism of the later empirics. His earliest studies were of the chemistry and morphology of the blood, later of inflammation, and then of the connective tissues, the work marking the culmination of the first Berlin and Early Würzburg periods of his studies, being

upon thrombosis and embolism—a new and important chapter in pathology. Later he proved himself the greatest of reformers in scientific medicine by his work on cellular pathology, that classic being published in 1858. After many controversies there followed universal acceptation of the great truth formulated by him—*Omnis cellula e cellula*. On this is builded the superstructure of modern medicine. A study of Virchow's special pathologic investigations would lead one into every branch of pathology. The true position of pathologic anatomy was first clearly defined by him, as he showed the importance of clinical medicine, experimentation, study of allied sciencies, etc., as aids to the interpretation of pathologic conditions found at autopsy. He taught that disease is not an entity, but is life under changed conditions.

Virchow's activity was not confined to pathology alone. He was also a recognized master in anthropology and ethnology, a foremost archeologist, a competent Egyptologist. He mastered social and economic problems and took most advanced ground in politics. His active political life dates from 1859, when he was elected to a a seat in the city council of Berlin, the duties of which position he conscientiously performed for over 42 years. In 1862 he entered the Prussian Chamber as a representative of the Freisinnig or Radical party, in which capacity he served until 1878, when he made over the Liberal leadership to Eugene Richter. For 25 years he has acted as chairman of the Committee on Finance, retaining his seat in the Chamber up to the present year. For 13 years following 1880 he represented a Berlin constituency in the Reichstag. He always felt that he belonged to the people, and hence he was always found on the bench of the opposition. As a result of this he was maltreated by the government to the full extent of its possibilities. His main adversary was Bismarck, who once challenged him to a duel. Nevertheless he was the greatest factor in all sanitary measures in Berlin and in the founding of its hospitals, and the organization of the medical care of soldiers in the campaigns of 1866 and 1870 was largely his work. For many years he held the presidency of the Beliner Medicinische Gesellschaft, one of the most important medical societies of Europe. As a linguist he was a marvel to scientific men.

Virchow's eightieth birthday in October, 1901, was a memorable event, and universal honor and tribute such as has been paid to no other modern man while yet living was heaped upon him by the profession in all parts of the world. A celebration attended by the prominent physicians of Europe was held in Berlin, Virchow himself making a most felicitous speech nearly two hours in length, an attestation of his wonderful vigor. In America, meetings of representative medical men to pay tribute to the man and his great work were held in New York, St. Louis, Milwaukee and elsewhere. Festschrifts and special numbers of numerous journals were dedicated to him.

Of less than average stature, Virchow was possessed of a constitution of unusual vigor, capable of withstanding continued activity

in the most exhausting duties. In manner he was modest and winning, his expression searching but friendly, and though no orator his speeches were effective, and as a conversationalist he was most delightful. One of Virchow's admirers in eulogizing him said: "He is more nearly omnicient than any other man the world has seen in a hundred years." In January, 1902, Virchow, in stepping from a street car, fell, sustaining a fracture of the femur, from which he never fully recovered.

The Use of Adrenalin Chlorid in Ophthalmology.—This substance is dispensed commercially in 1 : 1,000 solution, and is used in the eye in further dilution up to 1 : 10,000. Boiled water or sterilized salt solution should be used as a dilutent, and the solution should be kept in stoppered colored bottles, or it will turn red, although its activity is retained. When instilled in the eye it causes at first a slight smarting, and there is soon noticed a blanching of the conjunctiva, particularly about the caruncle, most marked in about five minutes. After five or ten minutes the effect gradually subsides. The solution does not produce anesthesia nor is the pupil or accommodation affected, and it is likely that in weak solution intraocular tension is unaltered, although adrenalin has been recommended to reduce abnormally high tension. No toxic effects have been reported in ophthalmic literature. On account of the frequent instillations necessary and the tendency to oxidation it is better to use the adrenalin alone rather than in combination, and before the application of cocain or atropin. It is not so active in acute as in chronic hyperemia. It is rapidly absorbed in the anterior chamber, and hence is of value in iritis in conjunction with atropin. It is especially efficient in revealing the photophobia due to inflammation of the anterior ocular segment, but must not be used in certain forms of corneal ulceration associated with marked denutrition. The instillation of the solution before and during ocular operations helps to control hemorrhage, and no secondary hemorrhage has been observed, although after section of the larger vessels this may be quite possible. Two or three minims of adrenalin solution injected under the conjunctiva has a more lasting effect in tenotomy. Reynolds contends that in many cases adrenalin will so reduce swelling in the lacrimal passages as to allow the use of Anel's syringe without previous probing. It is claimed by Ferdinand and others that the instillation of adrenalin solution seems to hasten the absorption of serous exudation, and certainly assists in the dissipation of subcorneal deposits.

There is, however, not entire unanimity of opinion in regard to the effects of adrenalin. Stanley Green reports its employment in enucleation without benefit, although he had previously used liquid suprarenal and chloretone without any loss of blood. As a warning against its promiscuous use Lemere states that the superficial blanching of conjunctiva caused by adrenalin is accompanied by engorgement of the deeper ciliary vessels, and that if there is a tendency to iritis, as in some cases of corneal ulceration, instilla-

tions of adrenalin are not without disastrous results. After a fair trial, Marple believes that adrenalin is of little use in ophthalmology and may prove dangerous. He suggests that the anemia following its employment may favor infection after operations, and he thinks that he has seen two cases in which its application was likely the cause of iritis.—Amer. Med.

Contagious Eye Diseases in New York Schools.—In a letter to the Board of Education, July 30, Health Commissioner Lederle asked that a room in each school be set apart for an inspection from the Board of Health to examine the pupils. He proposes to employ specialists for work not hitherto undertaken in that city, and states that the "most important part of the work is to be the examination of the school children for contagious eye diseases. During the last two weeks of the school year just closed I appointed 12 eye specialists to find out the extent of contagious eye diseases among the children. The experts examined 55,000 children in 36 schools, and no doubt you will be surprised and shocked as I was to learn that no less than 6,670 children, or 12 per cent., were afflicted with contagious eye diseases. Of this number 2,328 were suffering from the severest type of trachoma. All of these children should be excluded from school." The city superintendent stated that there was some ophthalmia among the children, but he thought the above report was exaggerated. Physicians to examine children should be employed by the Board of Education, and not by the Board of Health. He has been informed that inspectors from the latter board have wrongly diagnosed the troubles of children. After debate it was decided to set apart a room in each school for the specialists.—Amer. Medicine, Aug. 9.

Preventable Blindness.—About twenty years have passed since Credé showed that gonorrheal conjunctivitis of the new-born, the scourge of maternity hospitals and the cause of so much blindness, can be positively prevented. Every text-book on the eye has since that time described Credé's method and preached its necessity. Every text-book of obstetrics has contrasted the state of affairs before and since the introduction of "Credé" in lying-in institutions, and yet how little is this simple and efficient prophylactic used outside of hospitals.

Some years ago Cohn learned by means of statistic correspondence with all physicians in Breslau, that in that city 2 per cent. of all the children born in private practice were still allowed to contract the disease and risk blindness. The same oculist, so well-known for his statistic researches, has recently shown that in institutions for the blind in Germany 20 per cent. of the inmates still owe their blindness to the neglect of the obstretrician. This per centage, contrasted with 28 per cent. of 25 years ago, shows but a very small progress in preventative medicine in actual practice.

Yet Credé's method has been almost universally employed in hospitals and no voice has ever been raised against its efficiency. Many series of thousands of cases have been published by different

authors and all agree that even with 10 per cent. or more of demonstrable gonorrhea in the mothers the offspring are absolutely protected by the faithful employment of nitrate of silver instillations. It has been urged, however, that Credé's method may cause an unpleasant, even an inflammatory, though not dangerous, reaction of the conjunctiva. It was especially Cramer who recently again described undue conjunctival irritation following the use of nitrate of silver in babes.

In an able article, written in a tone of conviction, these objections to Credé are refuted by Leopold. He shows by quotations from Cramer that the latter did not use Credé's method with the simplicity and gentleness recommended by Credé himself. Credé's original directions were to open the eyes immediately after the bath, and to allow a single drop of a 2-per-cent. solution of nitrate of silver to descend from a glass rod on the cornea by contact. No other manipulation of any kind was to follow. By carrying out these directions literally no unpleasant reaction was seen by Leopold and his assistants in some 30,000 instances. The efficiency of the method is illustrated by the records of the year 1898. Among 2146 birth there were three instances of conjunctivitis and all three could be traced to inefficient applications of Credé's method by some untrained pupils during a rush of obstetric work. A later secondary infection can, of course, not be prevented by the use of Credé's instillation at birth, which counteracts merely the infection at the time. In a final note, Leopold adds that he has used a 1 per cent. solution of nitrate of silver on the last series of 698 children without provoking even the slightest irritation and with absolute prevention of primary infection of the eyes.

Most physicians realize to-day that in every instance in which the obstetrician can not be sure of the absence of gonorrheal infection (and how often can he be?) the slight trouble of using Credé's method is repaid by the certainty of avoiding blindness. But unfortunately, there are some who will not profit by the experience of others and who will have to see personally the havoc done by conjunctivitis neonatorum before they will take the pains to guard against it.—Journ. A. M. A.

Dr. Aaron Friedenwald died at Baltimore, August 26, from the effects of an operation undertaken for the relief of cancer of the stomach, aged 65. He had suffered from gastric symptoms for some months past. Early in May he went to Europe, and, August 1, the diagnosis of carcinoma was made. Dr. Friedenwald at once returned to Baltimore. August 20 an operation revealed such extensive involvement of the structures about the pylorus as to make only a gastro-enterostomy possible. The operation was concluded with satisfaction and hopes were entertained that he would recover from it. But vomiting set in, with uncontrollable hiccough, and he died six days later.

Dr. Friedenwald held a high rank in the medical profession of this country. He was born in Baltimore, Dec. 20, 1836. He obtained his medical degree at the University of Maryland in 1860,

and was a student in the office of Prof. Nathan R. Smith. He then spent two years in Germany preparing himself under Von Graefe and other great specialists in Berlin, Vienna, Prague and Paris for the practice of his chosen specialty. Returning to Baltimore he entered upon practice as an ophthalmologist and otologist, which he continued up to the time of his last illness. In 1873 he became a member of the faculty of the College of Physicians and Surgeons, and was always one of its most steadfast supporters. To him in very great degree the college owed its success. He also held the position of treasurer and chairman of the executive committee of the institution for many years.

Dr. Friedenwald was a public-spirited physician and took an active part in professional and civic work. He was a member of the American Medical Association; a member, and in 1889-1890, president of the Medical and Chirurgical Faculty of Maryland; first president of the Maryland Ophthalmological Society. It was on his motion, as a representative of the College of Physicians and Surgeons, that the Association of Baltimore Medical Colleges, in 1890, became a national organization at Nashville. He was a frequent contributor to the medical journals and to the proceedings of medical societies. --Jour. A. M. A.

Blindness During Eye Movements.—We called attention some time ago to the contention of Professor Raymond Dodge, of the Department of Psychology of Wesleyan University, that during movements of the eye we are unable to see anything. The proof of this he considers to be ample from the fact that we are never able to see our own eyes move in a mirror. We may be able to see one eye move by means of the other, but a single eye can never perceive its own movements no matter how carefully it may watch for them. He says:

"The general law that we are practically blind during a fraction of a second at each eye movement has a number of unsuspected consequences. Many a sleight-of-hand trick, apparently depending on a rapidity of movement, really depends for its success on these movements of blindness when the spectators' eyes attempt to follow a rapid movement of the operator's hand, or unconciously move in obedience to some other suggestion. More serious are such moments of blindness to the boxer or the fencer. Empirical expediency long ago developed the maxim that both the boxer and fencer should fixiate the eyes of the opponent. This is not merely to avoid giving cues of intended movements, but also to avoid the disastrously numerous movements of blindness which would result if one would attempt to follow the motions of an opponent's hand.

The professor gives some directions with regard to the viewing of scenery which are of especial value at this season of the year. To watch the scenery from a railway car with a minimum of fatigue pains must be taken to look through a window well a head. It is even better, if one can sufficiently control the eye muscles to fixate some point on the window glass one or two seats ahead. The eyes will, in this way, be kept motionless, while the general features of the landscape may be seen quite plainly.—Med. News.

BOOK NOTICES.

System of Physiologic Therapeutics.

Cohn. Vol. IX, Hydrotherapy, Heat, Light, etc. P. Blakiston's Son & Co., Philadelphia.

Readers of the ANNALS for this year will remember the review of five previous volumes of this series. The present, ninth volume, is largely a translation from the original German of Winternitz (Vienna), Strasser (Vienna), Buxbaum (Vienna), and Kisch (Prague). There is a supplement on Heliotherapy, Phototherapy and Thermotherapy, by Kellogg, of Battle Creek; and one on Saline Infusions and Irrigations, by Cushing, of Baltimore.

The text is readable and clear and the numerous illustrations modern. The editor has seen that no undue enthusiasm dominates the book, but I must suggest that in his index to appear in the final volume he harmonizes the suggestions for treatment—otherwise the inexperieneed reader will find himself sending a rheumatic patient to baths in a climate which the rheumatic must avoid.

Chapter IX of Part 2, page 502, has some pertinent remarks on diseases of the organs of special sense, including the eye.

A. B. HALE.

Origin and Prevention of Blindness.

(Enstehung und Verhutung der Blindheit. Auf Grund neuer Untersuchungen, bearbeitet von Dr. Ludwig Hirsch, Berlin.) Origin and Prevention of Blindness, studied in the light of newer investigations, by Dr. Ludwig Hirsch, Berlin. Reprint from the *Clinical Yearbook* (eight volumes), authorized by the Prussian Minister of Education. Jena. Gustav Fischer, 1902. 108 pages, 8 Vo. 3 marks.

The author has analyzed modern statistics to great advantage. His definition of practical blindness is as follows: The individual is blind when he must depend upon *feeling* in order to move about in a lighted space. He considers in the book only incurable blindness and separates congenital from acquired blindness, and analyses cases into right and left eyes; occupation before and after blindness, occupation of parents, the duration of the blindness and causes of it.

It is well to note his results, as some of them differ from those usually published. On page 23 he says of 149 cases of congenital cataract that technically speaking (i. e., clear, transparent pupil), 83 per cent. were failures; optically speaking (as regards vision), 95 per cent. were failures.

The *gonococcus* is, of course, guilty of the greatest injury to the eyes, 25.83 per cent. (In the discussion of treatment protargol is not mentioned.) Trachoma causes 2 per cent. If children are con-

sidered alone, the infectious diseases cause about 32 per cent. of blindness. The cases of blindness due to malaria have sunk to one-half the number since science has insisted on pure drinking water and obtained it through drainage. Small-pox has, of course, sunk to ridiculous insignificance since compulsory vaccination. Syphilis of every kind accounts for 7 per cent. I must yield to the temptation to smile at one of his hints for the prevention of syphilis. It is mainly proposed that a mutual aid society of prostitutes might be formed, members of which should, when infected, be entitled to hospital treatment for six months or more, or until the stage of infection had passed.

Injury, he says, is not nearly so common a cause of blindness as is usually supposed. The loss of *one* eye is due to injury in about 40 per cent., but blindness (that is, loss of *both* eyes) is caused by injury only in about 10 per cent., including sympathetic ophthalmia.

The poorer (in physicians) a district is, the higher is the relative number of the blind.

The last 12 pages are occupied by diagnosis or schematic illustrations of blindness, its causes, age and sex of patient and distribution (in Germany).

The monograph shows immense labor, painstaking and conscienciously performed. It would be a model for any one working the same field in the United States. A. B. Hale.

Contributions from the Stockholm Caroline Eye Clinic.

(Mittheilungen aus der Augenklinik des Carolinischen Medico-Chirurgischen Institutes zu Stockholm.) Contributions from the Eye Clinic of the Stockholm Caroline Medico-Surgical Institute. Edited by Dr. J. Widmark. Fourth volume. 1902. Gustav Fischer. Jena. 8 Vo., 130 pages. 4 marks.

The Stockholm Eye Clinic adds this year its fourth volume of "studies" of subjects within our specialty. It is by no means an annual report of the routine work of the hospital, but a collection of monographs representing the activity of thought and practice north of the Baltic.

There are eight essays:

I. A case of intracapsular resorption of senile cataract.
II. Clinical and bacteriological observations on influenza conjunctivitis in nursing babies.
III. May's operation for symblepharon.
IV. Two cases of concrement in the superior canaliculus.
V. Etiology of shortsightedness.
VI. The siderophone.
VII. A case of blepharochalasis.
VIII. The significance of venereal disease as a cause of blindness.

Most of these essays are reprinted from other publications or reports to societies, but they are well worth reading, and in this way are more apt to reach the eye of the general public.

In I, the author, Lindahl, was lucky enough to have an absorbed

cataract (i. e., capsule and epithelium) for microscopic examination.

In V, Widmark tries to trace some connection between anisometropia, especially if one eye is relatively amblyopic—astigmatism and school myopia. He has a fairly large number of cases supporting his theory, but acknowledges that much more study is needed before his point can be accepted.

The *Sideraphone* is an ingenious instrument intending to replace the Sideroscope at the bedside or in a room where the permanent instrument cannot be employed. The principle is that of the telephone; contact and consequent sound is produced when the siderophone is approximated to a foreign body (or iron or steel) within the orbit or any tissue. Jansson has not yet perfected it, but some of his experiments with the sidereoscope as control are encouraging. Its practicability and cheapness will make it of immense service, if it becomes a success. Widmark thinks the statistics of eye diseases if carefully analyzed will show an increase over the accepted percentage of blindness due to venereal disease, especially syphilis. The majority of cases, he says, come from the country, where special treatment is difficult to obtain, and when registered in a hospital are apt to have a local disease such as chorioiditis so that its cause—syphilis—escapes registration.

At the end of his essay he refers to the work of Hirsch (see review above) to support his view, though he declares that he did not know of Hirsch's treatise till after the Swedish publication of his own (Widmark's) article.

Such additions to our literature are to be encouraged. They bring us all nearer together. A. B. Hale.

Syphilis of the Orbit.

Prof. Dr. W. Goldzieher, Budapest. Collection of ophthalmological essays, by A. Vossius, Vol. IV, Heft 8. Hale a/S., Carl Marhold, 1902. 25 cents.

Since very little of this subject is found in the textbooks, G. took it up for a brief, but complete discussion. From his own observations and clinical histories, published by others, he gives the following resumé:

In every case of rapidly growing exophthalmus the orbital margins must be searched for signs of periostitis. Even if anamnestic data are lacking, the former points to syphilis when accompanied by thickening of the upper orbital margin. In the absence of periostitis, pain, spontaneous or elicited by pressure on the bone, is in favor of syphilis, especially nocturnal periorbital pain. The diagnosis gains in certainty, if associated with periostitis of other cranial bones. These rules have special value in symmetrical rapidly developing tumors of the orbit, and, if not contraindicated, always justify antisyphilitic treatment. C. Zimmermann.

Etiology and Morbid Anatomy of the Ocular Palsies.

S. Bernheimer, Prof. Innsbruck, Graefe-Saemisch, Handbuch der gesammten Augenheilkunde, 2nd edition, newly written, with 11 figures. No. 39. Leipzig, W. Engelmann, 1902. 2 m. 50 cents.

B's article is the second appendix to chapter XI, "Disturbances of Motility, with an Introduction on the Normal Movements of the Eye," by the late A. Graefe, while appendix I will contain "Results of the Most Recent Investigations of Disturbances of Motility of the Eyes," by Dr. A. Bielschowsky, of Leipzig. Bernheimer discusses first the etiology in the widest sense of the word, i. e., those affections of the central nervous system, other organs or the whole organism which, by their kind of detrimental influences, might as the first cause, lead to disturbances of motility. Hemorrhages and tumors of the brain, encephalitis, bulbar paralysis, spastic paraplegia, syringomyelia, locomotor ataxia, progressive paralysis are considered in that respect as they give rise to ocular palsies, while the motor disturbances in hysteria, neurasthenia and traumatic neurosis are in B.'s opinion rather spastic conditions. Of general affections the infectious diseases play an important part in the etiology of ocular paralysis, as acquired, more rarely hereditary, syphilis, diphtheria, influenza, rheumatism, herpes zoster ophthalmicus, measles, scarlet fever. Intoxications, diabetes, affections of the kidneys, Graves' disease, acromegaly, diseases of the nasal sinus, purulent otitis media may directly or indirectly create paralysis of the ocular nerves. Quite a number of cases of congenital defects of ocular motility have been observed, partly hereditary, partly acquired during labor. The second part is devoted to the morbid anatomy of the cerebral or central (cortical, subcortical or supranuclear, nuclear and fascicular) and extracerebral (basal and orbital) paralysis and finally to those of myogeneous origin. The literature is extensively quoted with the critical comments of the author who has largely contributed to this field by original investigations.

C. ZIMMERMANN.

The American Year Book of Medicine and Surgery.

In two volumes. Vol. I, including General Medicine, Octavo, 700 pages, illustrated; Vol. II, General Surgery, Octavo, 684 pages, illustrated, Philadelphia and London. W. B. Saunders & Co. 1902. Per Vol., Cloth, $3.00 net; Half Morocco, $3.75 net. Under the editorial charge of George M. Gould, M. D.

The editorial department of the volume on surgery is the same as last year with the exception that in the absence of Dr. W. W. Keen from the United States, Dr. J. Chalmers DaCosta took charge of the department of surgery with the assistance of Dr. J. H. Gibbon.

The department of ophthalmology has been, as heretofore, very ably edited by Howard F. Hansell, M. D., and Wendell Reber, M. D., of Philadelphia, who under the headings: Refraction, Muscles, The Eye in General Diseases, The Eye and Nose, Diseases of the

Lids, Conjunctiva, Lacrimal Diseases, Diseases of the Cornea, Affections of the Lens, Diseases of the Iris, Diseases of the Chorioid, Sympathetic Ophthalmia, Glaucoma, Diseases of the Vitreous, Diseases of the Optic Nerve, Injuries, Operations, Therapy and New Instruments, have, in 47 pages, given in a concise and readable manner, the gist of the important and practical articles that appeared during the latter part of 1900 and first part of 1901—with reference to the original articles. This year's volume of surgery is certainly sufficient to maintain the reputation established when the Year Book was first placed before the profession.

NELSON M. BLACK.

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